The amphipod family Pleustidae (mainly subfamilies Mesopleustinae, Neopleustinae, Pleusymtinae and Stenopleustinae) from the Pacific coast of North America: systematics and distributional ecology.

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Abstract

Based mainly on Canadian Museum of Nature collections, the following pleustid taxa are described and illustrated: *Neopleustinae* - ***Shoemakeroides***, n. g. (Type species - *Sympleustes cornigerus* Shoemaker), *Neopleustes* ***columbianus*** n. sp.; Pleusymtinae - ***Budnikopleustes*** n. g. (Type species - *Pleusymtes vasinae* Budnikova), *Pleusymtes* ***pacifica*** n. sp., ***P. pribilofensis*** n. sp.; ***Holopleustes aequipes*** n. g., n. sp.; ***Rhinopleustes acuminatus*** n. g., n. sp., ***Kamptopleustes spinosus*** n. g., n. sp., ***Anomalosymtes coxalis*** n. g., n. sp. and ***Heteropleustes setosus*** n. g., n. sp.; Stenopleustinae: ***Gracilipleustes*** n. g. (Type species - *Stenopleustes gracilis* Holmes). The following subfamily transfers are proposed: (1) to Stenopleustinae: *Arctopleustes* Gurjanova; (2) to Pleustoidinae: *Pleusymtes mediterranea* Ledoyer (restored to *Pleustoides* Gurjanova); (3) to Pleusymtinae: *Pleustomesus* Gurjanova and *Pleustostenus displosus* Gurjanova. The following species transfers are proposed: (1) *Parapleustes kussakini* Budnikova and *Parapleustes euacanthoides* Gurjanova to *Neopleustes;* (2) *Pleusymtes coquilla* Barnard and *Pleusymtes kamui* Ishimaru to ***Kamptopleustes*** n. g.; (3) *Pleusymtes brachypalma* Ishimaru to ***Heteropleustes*** n. g.; (4) *Parapleustes major* (Bulycheva) and *Neopleustes triangulocula*ta (Bulycheva) to *Gnathopleustes* Bousfield & Hendrycks; (5) *Parapleustes bicuspis* (Kroyer) to *Incisocalliope* J. L. Barnard. Phyletic relationships between and within the subfamilies are suggested by numerical analysis of principal character states, and arctic-subarctic biogeographical relationships of the North Pacific pleustid fauna are delineated.

Introduction

The amphipod family Pleustidae encompasses relatively primitive, rostrate, hydrodynamically plated, medium-sized benthic gammarideans of mainly North Pacific regional endemicity. Mouthpart morphology and life style are suggestive of opportunistic carnivores that prey on small benthic invertebrates and settling larval stages of larger animals (Enequist 1950; Crane 1969). The animals tend to perch openly on benthic or algal substrata, but fish predation may be minimized variously by Batesian mimicry (Field 1974; Carter & Behrens 1980), cryptic and/or warning colouration (Slattery & Oliver 1987), and presence of noxious terpene compounds in body tissues (Anderson 1988).

Family Pleustidae was formally subdivided into 12 subfamilies by Bousfield & Hendrycks (1994a) of which only Austropleustinae has not yet been recorded from the North Pacific region. Subfamilies Atylopsinae, Stenopleustinae, Mesopleustinae, Eosymtinae, and Pleusirinae are each represented by a single species, and these in the North American (eastern) sector only. Based mainly on material from the North Pacific region, the genera and species were more fully described and figured in subsequent treatments: Pleustinae (Bousfield & Hendrycks 1994b) and Parapleustinae, Dactylopleustinae, and Pleusirinae (Bousfield & Hendrycks 1995). The present study treats the sytematics and distributional ecology of the genera and species mainly of subfamilies Mesopleustinae, Neopleustinae, and Pleusymtinae, and previously untreated small subfamilies in the North Pacific region.

Much of the previous regional work on subfamilies Neopleustinae and Pleusymtinae has centred on the western North Pacific. Most of the known species have been described in extensive faunistic papers by Gurjanova (1938, 1951, 1972), Bulycheva (1952, 1955), Margulis (1963), and Budnikova (1995). Ecological, taxonomical, and distributional aspects of species of the northern Sea of Japan and Okhotsk Seas have been developed by Tzvetkova & Kudrjaschov (1985), and Tzvetkova & Golikov (1990). Notable taxonomic studies on Pleusymtinae and Neopleustinae in Japanese coastal marine waters have been undertaken by Ishimaru (1984, 1985, 1994), following earlier work by Nagata (1965), and Hirayama (1988).

In the eastern North Pacific region, previous work on these subfamily groups has been less extensive. Relatively few species were found in coastal marine waters of California by Barnard (1962, 1969b, 1971, 1975) and Barnard & Given (1960). In the Pt. Barrow region of Alaska, studies on these groups were pioneered by Shoemaker (1955, 1964) and Barnard (1959). Cogni-

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zant of the few isolated records of Pleusymtinae and Neopleustinae in the intervening northwestern Pacific region, summarized by Austin (1985) and Staude (1996), the new and generically diverse fauna of this study was largely unexpected.

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Material and Methods

Station lists and maps pertinent to CMN field material are provided by Bousfield (1958, 1963, 1968); Bousfield & McAllister (1962); and Bousfield & Jarrett (1981). Numbers of specimens collected at some stations are given in parentheses.

Diagnostic accounts attempt to treat major character states consistently across the taxonomic spectrum, and avoid duplication within superfamily, generic, and species levels. Taxonomic grouping of characters and states reflects functionality. Thus, although coxal plates are technically outgrowths of segment 1 of corresponding peraeopods, they serve effectively as immovable lateral body plates and are therefore treated as a unit, separate from the movable peraeopods. Morphology of mouthparts, gnathopods and other taxonomically significant characters and states follows terminology provided by Cole (1980), and Bousfield and Hendrycks (1994a).

Analyses of possible phyletic relationships utilize a semi-phyletic modification of the UPGMA system of Sneath and Sokal (1973). Character states are ordered phyletically by values of 0, 1, and 2 for plesiomorphic, intermediate, and apomorphic states, respectively. The phyletic placement of a given taxon is represented by a numerical sum of character state values termed the Plesio-Apomorphic (P.-A.) Index, of which the maximum value is twice the number of characters utilized in the analysis.

Table I. Abbreviations used in figures and tables

A1-2	-	antenna 1, 2
ABD	-	abdomen
ACC FL	-	accessory flagellum
BR PL	-	brood plate
CX	-	coxal plate
DCTL	-	dactyl
EP 1-3	-	epimeral plates 1,2,3
GN 1-2	-	gnathopods 1, 2
HD	-	head
INCIS	-	incisor
I. P.	-	inner plate
I. R.	-	inner ramus
LAC	-	lacinia
LFT	-	left
LL	-	lower lip (labium)
MD	-	mandible
MX 1-2	-	maxilla 1, 2
MXPD	-	maxilliped
O. P.	-	outer plate
O. R.	-	outer ramus
P3-7	-	peraeopods 3, 4, 5, 6, 7
PED	-	peduncle
PLEOS	-	pleosome
PLPD	-	pleopod
PLP	-	palp
RET	-	retinacula
RT	-	right
SP	-	spine
T	-	telson
U1-3	-	uropod 1, 2, 3
UL	-	upper lip (labrum)
UROS	-	urosome
X	-	enlarged
br. I, II	-	brood plate stage 1, 2
im	-	immature
juv	-	juvenile
subad	-	subadult

Systematics

Family PLEUSTIDAE Stebbing

MESOPLEUSTINAE Bousfield & Hendrycks

Type Genus: *Mesopleustes* Stebbing, 1899 (monotypic).

Diagnosis: Body large, robust, carinated middorsally on peraeon, pleon, and urosome 1; urosome segment 2 dorsally free. Head, rostrum strong. Antenna 1, peduncular segments 1-3 strong, lacking distal pro-cesses; accessory flagellum minute. Antenna 2 short.

Upper lip slightly emarginate apically. Lower lip, inner lobes lacking. Mandibular molar large, grinding surface with triturative ridges, molar seta short; left lacinia 6-dentate; right lacinia bifurcate; palp medium long. Maxilla 1, inner plate with 3-4 apical setae; outer plate with 11 apical spine-teeth. Maxilla 2, inner plate slightly elongate, with subapical inner marginal seta. Maxilliped, inner plate not shortened, apex with 5 "button" spines; outer plate large, broad; palp segment 3 not produced distally.

Coxa 1 bent forwards distally. Coxae 2-4 abruptly deeper, narrowing distally, ribbed medially. Coxae 5-6 shallowly posterolobate. Coxal gills medium, sac-like, on peraeopods 2-6.

Gnathopods strongly subchelate, dissimilar in form and size; carpus short; propodal palms with median tooth. Gnathopod 2, palmar margin excavate.

Peraeopods 3-4 strong; segment 5 short; dactyls strong; peraeopods 5-7 strong, subsimilar, bases narrow, posterodistal lobes distinct, rounded.

Pleopods strong, not sexually dimorphic. Epimeral plate 3, hind corner acuminate. Uropod 1, peduncle lacking distolateral spine, rami subequal. Uropods 2 & 3, outer ramus shorter than inner. Telson medium long, apically notched, keeled medially; penicillate setae distally inserted.

Remarks: Character states of the mouthparts are generally plesiomorphic: e.g., lower lip simple, molar large, with ridged triturating surface, molar seta, and maxilla 1 with apically setose inner plate.

Mesopleustes Stebbing

Mesopleustes Stebbing, 1899: 209;—Stebbing 1906: 315;—Barnard 1964: 321;—Gurjanova 1972: 133;—Barnard & Karaman 1991: 648.

Mesopleustes ?abyssorum (Stebbing)
(Figs. 1, 2)

Pleustes abyssorum Stebbing, 1888: 872, pl. 67.
Mesopleustes abyssorum Stebbing 1906: 315;—Barnard 1964: 321, figs. 4, 5;—Barnard 1967: 140, fig. 68;—Barnard & Karaman 1991: 649, figs. 115C, 116E;—Vinogradov 1994:115, fig.6.
Mesopleustes n. sp. Bousfield & Hendrycks 1994: 20, 36, figs. 2P, 4H, 5A, 5L, 5O, 6G, 6H.

Material Examined:
Cascadia Abyssal Plain, off Oregon, 2675 m. dredge, R.V. Yaquima, Jan. 16, 1970 - 1 ♂ (15.5 mm.)(slide mount), CMNC 2004-0137.

Diagnosis: Male (15.5 mm). With the characters of the genus and subfamily. Rostrum elongate, about as long as peduncular segment 1 of antenna 1, apex acute. Eyes small, round unpigmented, near margin of anterior head lobe. Antenna 1 about 0.7x body length, peduncle elongate, length of segments 2 & 3 about equal to segment 1, segment 2 with tongue-shaped posterodistal process; accessory flagellum minute, with short apical seta; flagellum with ~50 segments, length about 2x peduncle. Antenna 2 about 0.6x length of antenna 1; peduncular segments 4 & 5 strong subequal; flagellum ~30-segmented.

Mandible, incisor margins with 6-7 teeth; accessory spine rows with 14-15 slender blades; molar strongly triturative, ridges extend as sharp marginal teeth; palp segment 3 slightly longer than segment 2, inner margin lined with short D setae and 4-5 longer apical E setae; segment 2, inner margin weakly setose; segment 1, with 2 small slender inner marginal spines.

Maxilla 1, inner plate ovate, with 4 plumose apical setae; palp > outer plate, rounded apically; segment 1 short, segment 2 with 10 apical/subapical spines and 7 lateral setae. Maxilla 2, inner plate wider but shorter than outer. Maxilliped, inner plate with 3-4 setae on apicomedial face, 9-10 marginal setae, and 5 button spines; outer plate reaching more than 1/3 palp article 2; palp segments 1-3 subequal, not broadened; dactyl stout, slightly curved.

Coxal plate 1, anterior margin concave, directed anteriorly, apex acute, hind corner with small cusp. Coxae 2 & 3 with small posterodistal cusp. Coxal plates 5 & 6 shallowly posterolobate; coxa 7 rounded below.

Gnathopod 1, carpal length ~0.6x propodus , posterior lobe short, broad; propodus, palmar margin strongly oblique, finely denticulate, with strong submedial tooth, posterodistal angle with 3 clusters of strong spines;

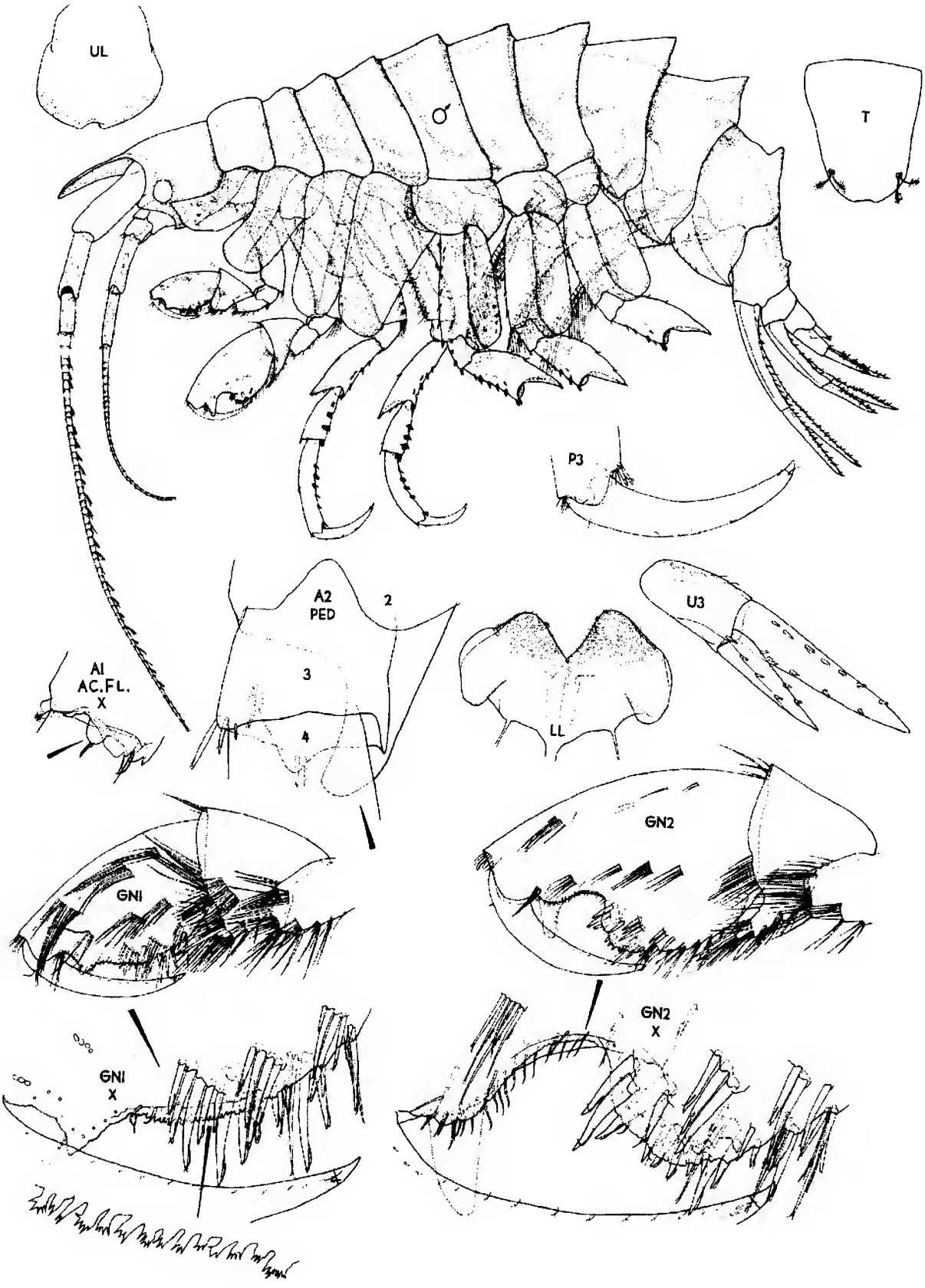

Fig.1. *Mesopleustes abyssorum* (Stebbing)?. Male (15.5 mm).
Cascadia Abyssal Plain, Off Oregon, 2675 m.

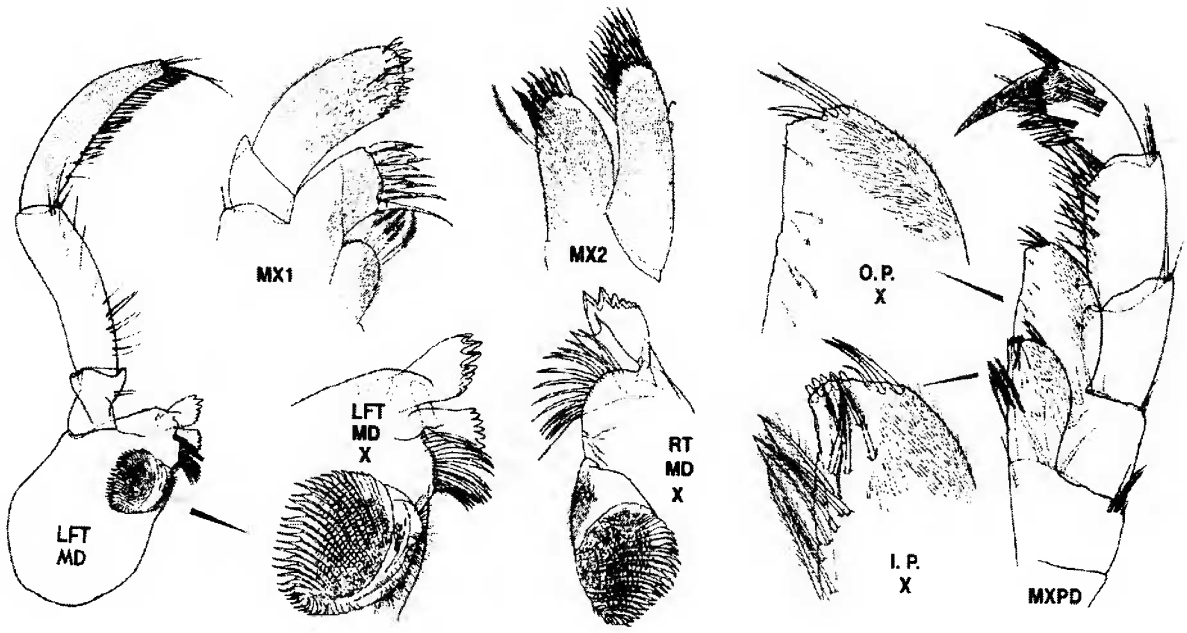

Fig. 2. *Mesopleustes abyssorum* Stebbing? Male (15.5 mm). Legend as in Figure 1.

dactyl long. Gnathopod 2, merus lacking distinct posterodistal tooth; carpal lobe narrow, setose, produced slightly along propod; propodal palm strongly oblique, sharply concave medially, proximally with a long protuberance, posterodistal angle with 4 clusters of stout spines extending onto palm, hind margin setose.

Peraeopods 3-4, basis, anterior and posterior margins with short setae; propodus slightly curved, 4-5 pairs of short spines along posterior margin. Peraeopods 5-7 subequal, basis of peraeopod 5 narrower, with shallow pits on its posterior face.

Epimeral plates 1-3, ventral margins with short setae. Uropods 1 & 2, peduncle longer than rami, margins serially spinose. Uropod 3, peduncle shorter than rami; rami with acute apices, margins with spines.

Telson medium, not exceeding peduncle; with 2 pairs of subapical marginal plumose penicillate setae. Female undescribed.

Distributional Ecology: Known from abyssal depths of the North Pacific, Indian, and Atlantic oceans; probably cosmopolitan (Barnard & Karaman 1991).

Remarks: The present material was initially felt to be specifically distinctive (Bousfield & Hendrycks 1994). It differs from *M. abyssorum* mainly in the deeper coxa 3, less pronounced middorsal carination (especially the semi-truncated pleon segment 2), less strongly produced hind corner of epimeral plate 3, and more elongate telson. Possible recognition as a new taxon awaits examination of a more extensive series of specimens.

EOSYMTINAE Bousfield & Hendrycks

Genera: *Eosymtes* Bousfield & Hendrycks, 1994a

Remarks: This subfamily differs from Pleusymtinae in relatively few superficial character states, and may be para-ancestral. Eosymtinae is characterized by its strongly ridged molar grinding surface and presence of a medial molar seta; inner plate of maxilla 2 with 2 strong submarginal setae, positioned subapically rather than medially or basally; inner plate of maxillipeds with 2 apical button spines; gnathopod propodal palmar margins lacking submedial tooth; and uropod 1, peduncle with undifferentiated distolateral spine.
This group has not been recorded since its original description. Because of overall superficial similarity, the genus *Eosymtes* is included in the key to genera of Pleusymtinae (p. 58). Principal character states of the type species *Eosymtes minutus* are illustrated in Fig. 3.

ATYLOPSINAE Bousfield & Hendrycks
emend Cadien & Martin

Atylopsinae Bousfield & Hendrycks, 1994a: 34.
Atylopsinae (emended) Cadien & Martin 1999: 593.

Genera: *Atylopsis* Stebbing, 1888; *Myzotarsus* Cadien & Martin, 1999.

Remarks: In classifying a new pleustid species commensal with lithodid crabs from off southern Cali-

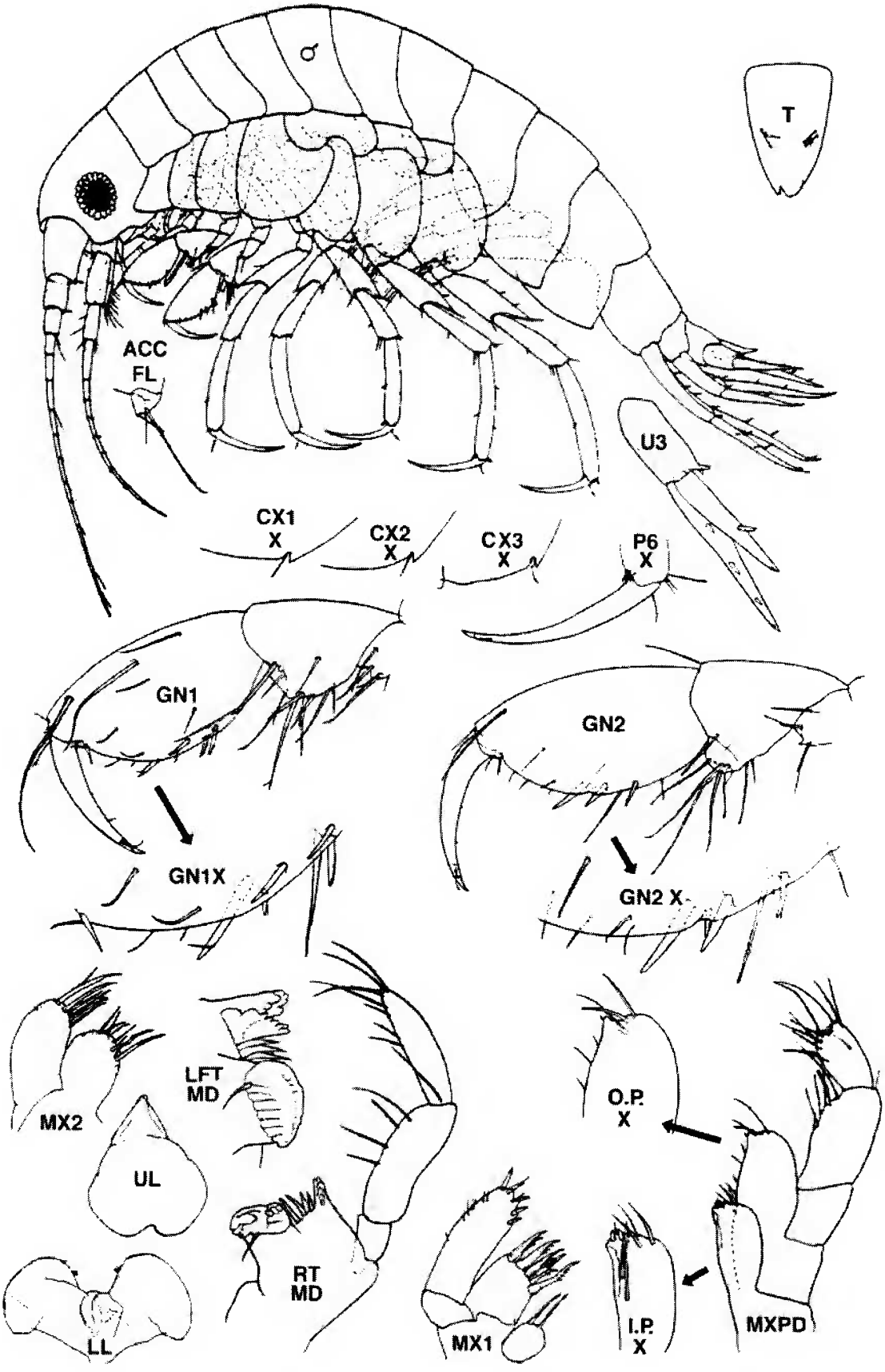

Fig. 3. *Eosymtes minutus* Bousfield & Hendrycks, 1994. Male (1.8 mm). St. Lawrence I., Bering Sea.

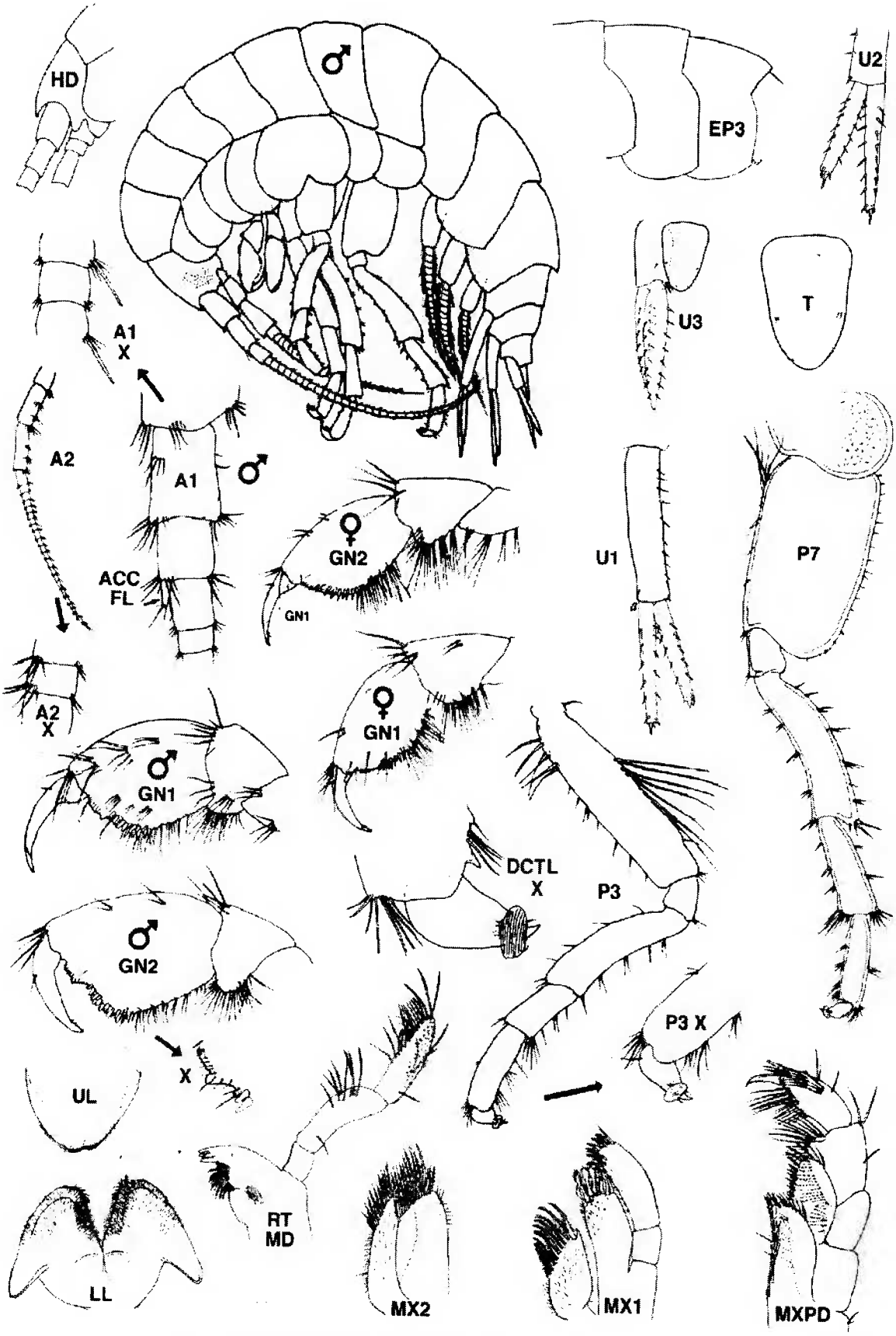

Fig. 4. *Myzotarsa anaxiphilius* Cadien & Martin Female (7-11 mm) . On *Paralithodes* sp. Off S. California.
(modified from Cadien & Martin 1999)

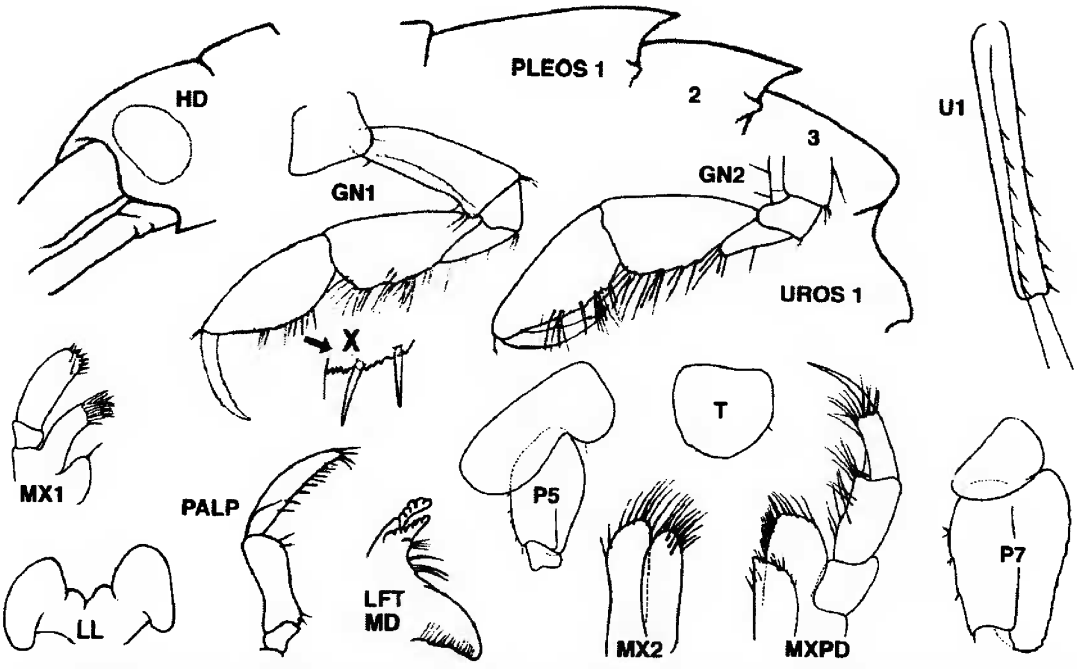

Fig. 5. ?*Pleustoides mediterraneus* Ledoyer. Female (6.0 mm). Off Marseilles. Bathyal. (modified from Ledoyer 1986)

fornia, Cadien & Martin (loc. cit.) modified the original diagnosis of the subfamily rather than create a new subfamily for its reception. Plesiomorphic characters states are especially prevalent in the morphology of the mouthparts, coxal plates, and uropods, although apomorphic in its peraeopods and sexually dimorphic gnathopods (Fig. 4). *Myzotarsa anaxiphilius* thus becomes the first record of the primitive southern pleustid subfamily Atylopsinae from the North American Pacific region.

Myzotarsa anaxiphilius Cadien & Martin
(Fig. 4)

Myzotarsa anaxiphilius Cadien & Martin, 1999: 594, figs. 1-10.

Remarks: *Myzotarsa anaxiphilius* was described from material trawled at 260-300 m off Redondo Beach, S. California. By means of sucker-like peraeopodal discs, the animals attach to the smooth abdominal underside of the king crabs *Paralithodes californiensis* and *P. rathbuni* that are parasitized by the rhizocephalan *Briarosaccus callosus*. The pleustids were found on no other regional species of lithodid crabs, and have not been reported from lithodids in fiords of British Columbia and further north (e.g., *P. camtschaticus*).

Re-examination of topotype material suggests a few minor adjustments to the original description. The elongate submarginal setae of the inner plate of maxilla 2 are located subapically, and coxa 5 is posterolobate.

The species is included in the key to subfamilies and genera (p. 58) and the principal character states are summarized in Fig. 4.

PLEUSTOIDINAE Bousfield & Hendrycks

Pleustoidinae Bousfield & Hendrycks, 1994: 36.

Genera: *Pleustoides* Gurjanova, 1972: 165 (=*Pleusymtes* (part) Barnard & Karaman, 1991: 651.

Remarks: Members of this subfamily are readily distinguished by the dorsolateral ridges and middorsal carinations of the peraeon and pleon segments, shallow coxal plates 1-4, large triturating molar, subsimilar "melphidippoid" gnathopods, and elongate uropods. Character states of *P. mediterraneus*, utilized in the key to subfamilies (p. 58) are illustrated in Fig. 5.

Pleustoides Gurjanova

Species: *Pleustoides carinatus* Gurjanova, 1972: 165, figs. 20, 21;—Bousfield & Hendrycks 1994: 36;—Barnard & Karaman 1991: 652 (transferred to *Pleusymtes)*; *Pleustoides quadridens* Bulycheva, 1955: 200, fig. 4 (*Sympleustes*);—Gurjanova, 1972: 167; *Pleustoides ochoticus* Gurjanova, 1972: 167, figs. 22, 23; *Pleustoides mediterranus* Ledoyer, 1986;—Ledoyer 1993: 666, fig. 456 (*Pleusymtes)*.

Remarks: The authors support Ledoyer's original assignment of *Pleusymtes mediterranea* to the genus *Pleustoides* Gurjanova, as exemplified by *P. carinatus*. Although he did not fully figure the antennae, accessory flagellum, pleopods, coxal gills, or brood plates of this species, Ledoyer detailed the plesiomorphic condition of the upper and lower lips, the single apical setae on the inner plate of maxilla 1, the very reduced size of the coxal plates, parts of peraeopods 3 and 4, the unproduced posterior corner of epimeral plate 3, the lack of distolateral spines on the peduncle of uropod 1, and the short apically rounded telson (Fig. 5). Although such differences separate *mediterraneus* as a distinct species, the majority of its character states, in combination, are closely similar to those of genus *Pleustoides* and subfamily Pleustoidinae. These also exclude *P. mediterraneus* from genus *Pleusymtes* and subfamily Pleusymtinae as defined herein (p. 57) and in earlier treatments of that group (e.g., Bousfield & Hendrycks 1994).

STENOPLEUSTINAE Bousfield & Hendrycks

Stenopleustinae Bousfield & Hendrycks, 1994: 35.

Genera: *Stenopleustes* Sars,1893; *Arctopleustes* Gurjanova, 1972; ***Gracilipleustes*** n. g. (p. 56).

Remarks: Subfamily Stenopleustinae is restricted to pleustid species with the following character states: Antennae subequal in length; antenna 1, peduncular segments not enlarged, weakly or not processiferous. Mandible, molar basally broadest, tapering distally, with "pavement" type grinding surface. Maxilla 1, outer plate with 6-7 apical spines. Maxilla 2, inner plate enlarged, median facial seta(e) located apically. Maxilliped palp, basal segment with tuft of outer marginal setae; inner plate with 3 apical "button" spines; palp segments of ordinary length, segment 3 produced beyond base of dactyl.

Coxal plates medium, increasing regularly posteriorly, posterodistal cusps weak. Gnathopod 1, carpus elongate. Peraeopods 3-7, basis regularly broadened, segment 5 shorter than segments 4 & 6. Epimeral plates 1-3, hind corners not produced. Uropods 1-3, rami not greatly differing in length; uropod 1 lacking distolateral peduncular spine. Telson proximally keeled.

Stenopleustes Sars

Stenopleustes Sars, 1895: 354;—Stebbing 1906: 316;—Gurjanova 1972: 132;—Barnard & Karaman 1991: 652.
Sympleustes Stebbing, 1899: 209.

Species: *Stenopleustes malmgreni* (Boeck, 1861); *S. eldingi* Gurjanova, 1930; *S. latipes* (M. Sars, 1858); *S. nodifer* G. O. Sars 1893; *S. olriki* (Hansen, 1887).

Remarks: Member species are characterized by relatively large body size, carinated pleonal segments, and powerful, unequal, often sexually dimorphic gnathopods. They are Arctic and North Atlantic, subarctic to boreal in distribution. Character states of *S. latipes* (Fig. 6) contrast with those of superficially similar genera in Neopleustinae (key, p. 98).

Stenopleustes olriki (Hansen, 1887) may merit separate generic distinction on the basis of the following character states: Antenna 1 elongate, peduncle 1 elongate; coxa 1 shortened, others deep; coxa 5 deeply posterolobate. Gnathopods 1 & 2 strongly subchelate, 2 larger; palm oblique, lacking concavity, with submedian tooth and palmar spines.

Arctopleustes Gurjanova

Neopleustes Gurjanova 1951: 646;—Dunbar 1954: 755.
Arctopleustes Gurjanova, 1972: 135;—Karaman & Barnard 1979: 112;—Just 1980: 42;—Barnard & Karaman 1991: 646.

Species: *Arctoplesutes ramyslovi* (Gurjanova, 1951); *A. glabricauda* (Dunbar, 1954).

Remarks: The genus was placed within subfamiy Stenopleustinae by Bousfield and Hendrycks 1994. It had been split off from *Neopleustes* by Gurjanova (loc. cit.) but remained closely allied with it based on the extension of maxillipedal palp segment 3 beyond the base of the dactyl. This character state similarity appears to be a case of morphological convergence since most other major (generic) character states are not those of subfamily Neopleustinae.

For comparative purposes, the principal morphological features of *Arctopleustes glabricauda* are presented here (Fig. 7). These include: rostrum small; antenna 1 distinctly longer than antenna 2; mandible, palp segments 2 & 3 with few inner marginal setae; maxilla 1, inner plate with 1-2 apical setae, outer plate with 6-7 uneven apical spines; maxilla 2, plates slender with few apical setae; maxilliped, outer plate very small, palp segments short; gnathopods 1 & 2 markedly

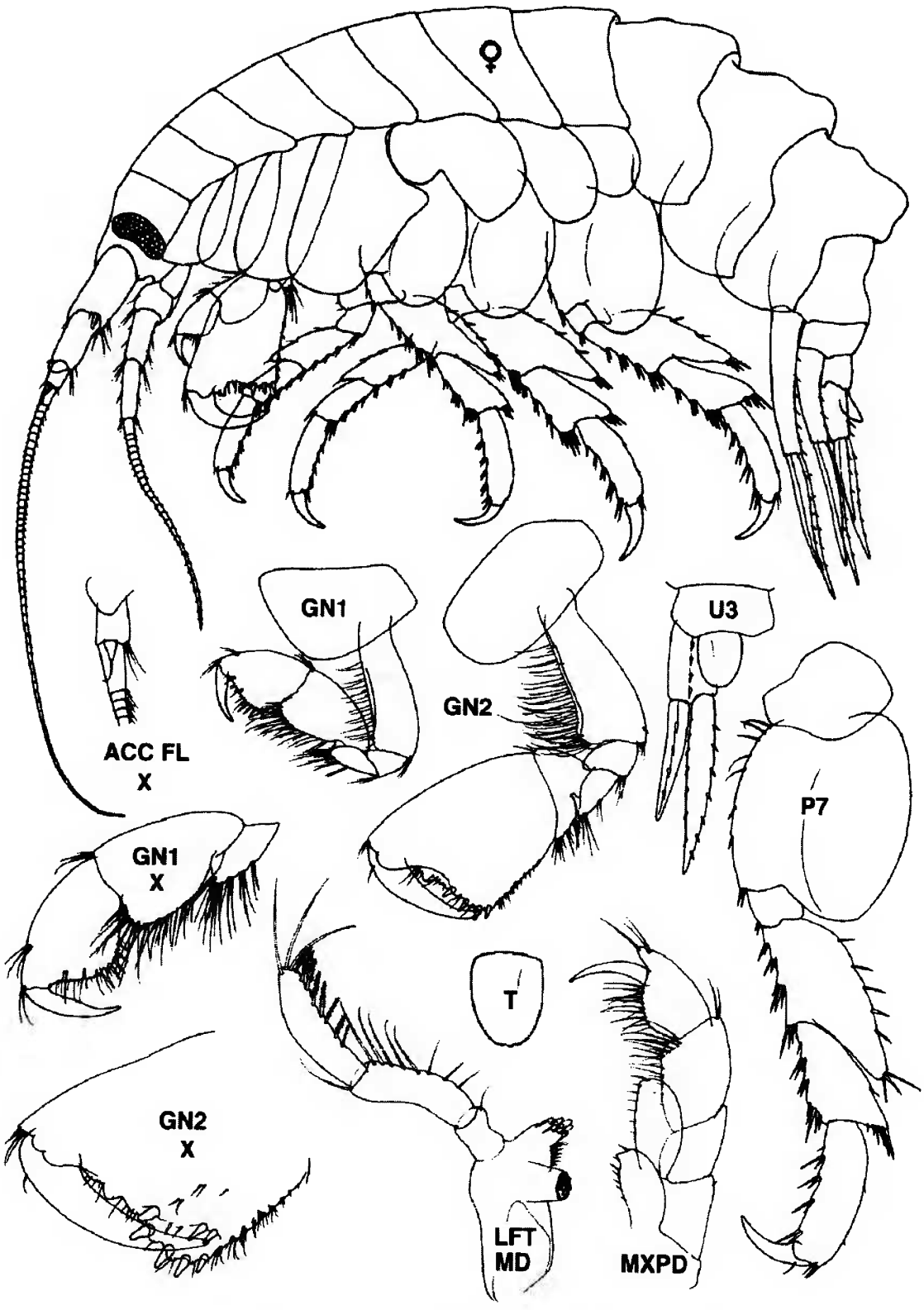

Fig. 6. *Stenopleustes latipes* (M. Sars). Female (to 12 mm). North East Atlantic, 50-1400 m. (after Lincoln 1979).

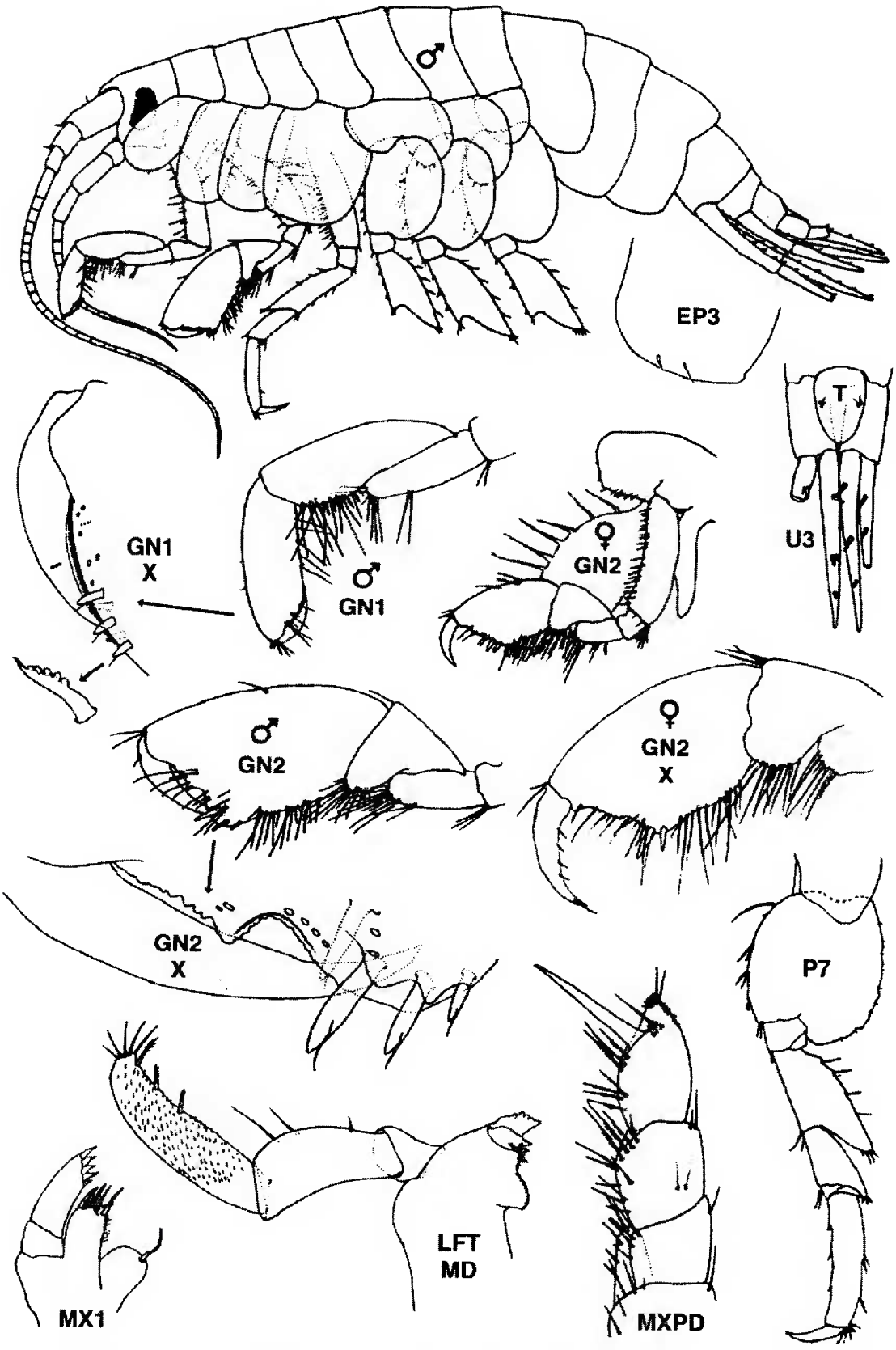

Fig. 7. *Arctopleustes glabricauda* (Dunbar, 1954): Male (4.2- 7.1 mm). Ungava Bay to E. Greenland. (male modified from Just 1980; female from Dunbar 1954)

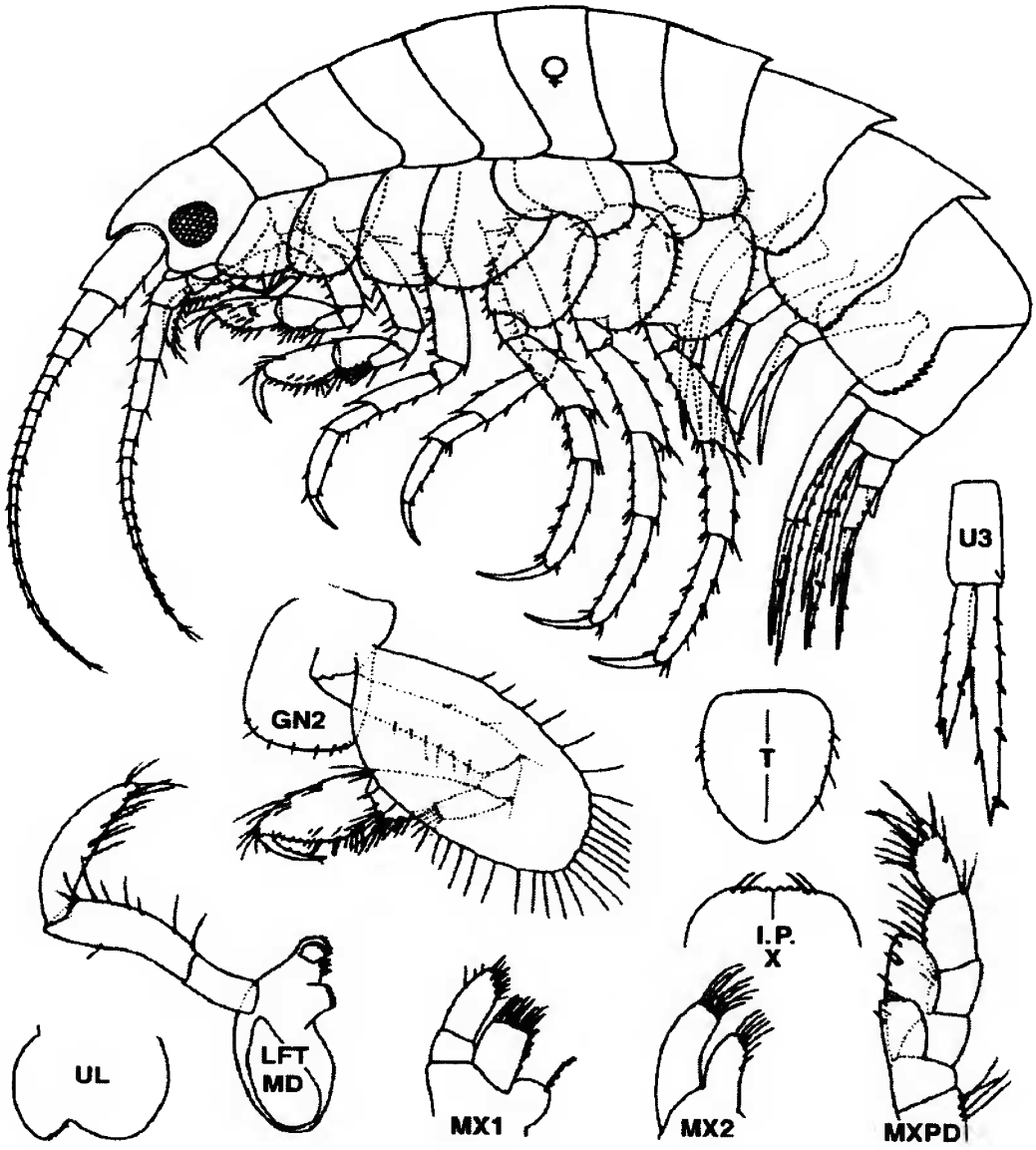

Fig. 8. ***Gracilipleustes gracilis*** (Holmes). Female ov (to 6 mm). off Woods Hole, Massachusetts. (after Bousfield, 1973)

dimorphic in form and size; epimeral plate 3 smooth behind; uro-pods 1 & 2, outer ramus not markedly shorter than inner.

***Gracilipleustes*, n. g.**

Sympleustes Stebbing, 1899: 209;—Holmes 1905: 487.
Stenopleustes Bousfield, 1973: 82.
Stenopleustes (part) Barnard & Karaman 1991: 652.

Type Species: *Sympleustes gracilis* Holmes, 1905.

Species: *Gracilipleustes gracilis* (Holmes, 1905); *G. inermis* (Shoemaker, 1949); *G. monocuspis* (Barnard & Given, 1960).

Diagnosis: Body small, occasionally dorsally mucronate. Rostrum short. Antennae slender, subequal in length. Accessory flagellum evanescent. Eyes large, round or rhomboidal.

Mandible, molar small, cylindrical, slightly compressed; palp segment 3 narrowing distally. Maxilliped, inner and outer outer plates regular, not reduced.

Coxal plates 1-4 medium shallow, posterodistal cusps very weak or lacking.

Gnathopods slender, subsimilar in form, gnathopod 2 larger than 1; basal segments, anterior margins weakly setose; carpal segment medium long, shorter than propod, lobes shallow to medium deep; propod, palmar margin smoothly convex, tooth vestigial or lacking.

Peraeopods slender, peraeopods 5-7 slightly increas-

ing in length posteriorly; dactyls elongate.

Epimeral plate 3, hind margin serrate, corner squared. Telson short, margins setose.

Remarks: The North American Pacific (S. California) species, *Gracilipleustes monocuspis* (Barnard & Given) differs in several respects from the two species of the genus known from the N. American Atlantic coast (fig. 8). Its gnathopods are more strongly developed and peraeopods more robust. However, *G. monocuspis* bears distinctive and conspicuous features of the genus in its large rhomboidal eyes, shallow coxal plates, dorsally mucronate pleon, and serrated hind margin of epimeral plate 3.

Etymology: The generic name *Gracilipleustes* combines the descriptive Latin name *gracilis* of the type species with the root name *pleustes.*

PLEUSYMTINAE Bousfield & Hendrycks

Type genus: *Pleusymtes* Barnard, 1969a: 425.

Genera: ***Anomalosymtes*** n. g. (p. 78); ***Budnikopleustes*** n. g. (p. 72); ***Holopleustes*** n. g. (p. 82); ***Kamptopleustes*** n. g. (p. 84); ***Heteropleustes*** n. g. (p. 74); *Pleustomesus* Gurjanova, 1972; ***Rhinopleustes*** n. g. (p. 70).

Transfers: *Pleusymtes kamui* Ishimaru to *Kamptopleustes,* and *P. palmata* Margulis to *Pleustomesus.*

Remarks: A large subfamily of about 45 species in 8 genera, about 75% of which are here assigned to subgroups within genus *Pleusymtes.* Six genera and most species are endemic to the subarctic North Pacific and the others are holarctic and arctic boreal. The genera and species are here clustered into five subgroups, as outlined, and in the key (p. 58). Pending further study of pertinent material, one or more of the subgroups may require formal taxonomic recognition.

Pleusymtes Barnard

Pleusymtes Barnard, 1969a: 425:—Lincoln 1979: 432;—Ishimaru 1985: 43;—Barnard & Karaman 1991: 651.

Species: 1. *Pleusymtes glaber* subgroup (p. 59): *P. glaber* (Boeck, 1861); *P. similis* (Margulis, 1963).
2. *Pleustes pulchella* subgroup (p. 59): *P. pulchella* (G. O. Sars, 1893); *P. margulisae* Tzvetkova & Golikov, 1990.
3. *Pleusymtes pacifica* subgroup (p. 59). *P.* ***pacifica*** n. sp. (p. 60); *P. subglaber* Barnard & Given, 1960; *P. derzhavini* (Gurjanova, 1938); *P. buttoni* (Dunbar, 1954); *P. quadrangularis* (Margulis 1963); *P. brevipes* Ishimaru, 1985.
4. *Pleusymtes pribilofensis* subgroup (p. 62): ***P. pribilofensis*** n. sp. (p. 62); *P. glabroides* (Dunbar, 1954); *P. uncigera* (Gurjanova, 1938); *Pleusymtes* sp. (= *Sympleustes uncigera* Shoemaker 1955).
5. *Pleusymtes mucida* subgroup (p. 68): *P mucida* Ishimaru, 1985; *P. japonica* (Gurjanova,1938); *P. karstensi* (Barnard, 1959); *P. kariana* (Stappers, 1911); *P. ochrjamkini* (Bulycheva, 1952); *P. suberitobia* (Gurjanova, 1938); *P. uschakovi* (Bulycheva, 1952).

Diagnosis: Body smooth. Head, rostrum weak or indistinct. Eyes medium large, rhomboidal. Antenna 1, peduncular segment 1 often enlarged, with posterodistal acute process. Accessory flagellum present, minute.

Upper lip, apical lobes variously asymmetric. Lower lip, inner lobes weak, narrowly sloped. Mandible, left lacinia 7-8 dentate, right lacinia lacking; molar strong, columnar, with pavement-type grinding surface; blades 6-8 on left, 6-12 on right; palp stout, more than twice length of body of mandible, with single strong basal A seta. Maxilla 1, outer plate with 9 tall apical spine teeth, inner plate with 1-2 apical setae. Maxilliped, inner plate short, broad, with 4 small apical spine teeth; outer plate narrow; palp strong, segment 2 usually longer than 1; segment 3 simple, without apical projection.

Coxal plates 1-4 medium deep, increasing regularly posteriorly; coxae 1-3 variously with single posterior tooth or cusp; coxa 1 rounded, not markedly bent forwards distally. Coxae 5-7 posterolobate.

Gnathopods weak to medium strong, slightly unequal in size and form, not sexually dimorphic; palmar margins usually with submedial triangular tooth or cusp. Gnathopod 2, merus with posterodistal tooth or spine; carpal lobe often narrow.

Peraeopods 1-2 slender, segment 5 slightly shorter than 4 & 6. Peraeopods 5-7, bases generally broad, hind margins convex.

Epimeral plate 3, hind corner square, acute, or with cusp or tooth, forming a small hook. Pleopods stout, natatory, not sexually dimorphic. Uropod 1, peduncle with distolateral stout spine. Uropods 2 & 3, outer ramus distinctly the shorter.

Telson subrectangular or narrowing distally, longer than wide.

Remarks: In accordance with a revision of the genus *Sympleustes* Stebbing, 1899, Barnard and Given (1960,

Key to Genera of Pleusymtinae and pleustid Subfamiles having a triturating molar.

1. Coxa 1 anterodistally bent forwards; coxae 1-3, posterodistal cusps often singly large, or medium and multiple (2-5 in number) ..... 2.
Coxa 1 normal, directed ventrally; coxae 1-3, posteodistal cusps usually single, medium to small in size.. 10.

2. Posterior peraeon and pleon strongly mid-dorsally carinated. ..... 3.
Body segments dorsally smooth or nearly so ..... 6.

3. Peraeon and pleon with dorsolateral ridges; coxae 1-4 shallow . .*Pleustoides*Gurjanova (Pleustoidinae)(p. 52)
Peraeon and pleon with middorsal carinations only; coxa 2-4 medium to large, deeper than broad. ..... 4.

4. Antenna 1, peduncular segment 1 lacking distal process; urosome 2 not dorsally occluded ..... 5.
Antenna 1, peduncular segment 1 with strong distal process; urosome segment 2 occluded dorsally by segments 1 & 3 ..... ***Rhinopleustes*** n. g. (p. 70)

5. Rostrum very strong, exceeding segment 1 of antenna 1; gnathopods 1 & 2 strongly unlike in size and form; peraeopods 5-7, bases narrowed, straight ..... *Mesopleustes* (Mesopleustinae)(p. 47)
Rostrum short, not exceeding antennal segment 1; gnathopods subsimilar in size and form; peraeopods 5-7, bases rounded behind ..... ***Budnikopleustes*** n. g. (p. 72)

6. Antenna 1, peduncular segment 1 lacking distal process; uropod 1 lacking peduncular distolateral (ecdysial) spine; mandibular molar with triturating grinding surface and medial molar seta. ..... Eosymtinae (p. 49)
Antenna 1, segment 1 with distal process; uropod 1 with peduncular distolateral spine; mandibular molar with "pavement" or "cobbled" grinding surface, lacking molar seta. ..... 7.

7. Antenna 1 with strong anterodistal process; coxae 2-4, narrow, deep; urosome 2 not occluded dorsally ..... ***Anomalosymtes*** n. g. (p. 78)
Antenna 1, segment 1 lacking anterodistal process (may have posterodistal tooth); coxae 2-4 normal, depth < twice width; urosome 2 partly to fully occluded dorsally ..... 8.

8. Rostrum weak, not exceeding anterior head lobe; lower lip, outer lobes widely separated, inner lobes shallow, flat; mandibular left lacinia 8-9 dentate; urosome not dorsally occluded ..... ***Kamptopleustes*** n. g. (p. 88)
Rostrum moderate to very strong, exceeding anterodistal head lobe; lower lip, outer lobes not widely separate, inner lobes sloped; left lacinia 6-7 dentate; urosome nearly or completely occluded .....9.

9. Rostrum medium; antennal peduncular process strong; peraeopods 5-7, hind margin of bases angular; uropod 2, outer ramus much shorter than inner ramus (< 2/3) .....*Pleusymtes pribilofensis* subgroup (p. 62)
Rostrum often strong; antennal peduncular segment 1, process weak; peraeopods 5-7, hind margin of basis rounded; uropod 2, outer ramus 80% of inner ..... *Pleustomesus* Gurjanova (p. 84)

10. Peraeopod 7, basis narrow, segment 6 short, not longer than 5; uropod 1 lacking ecdysial spine; mandibular molar with striated grinding surface and medial seta ..... *Myzotarsa* Davis and Martin (Atylopsinae)(p.52)
Peraeopod 1, basis usually broadly rounded; segment 6 normal, > segment 5; uropod 1 with stout distolateral peduncular spine; mandibular molar lacking medial seta, molar surface of "pavement" type ..... 11.

11.Antenna 1, peduncular segments 2 & 3 very short, <1/2 segment 1; peraeopods 5-7 closely subsimilar in form and size; mandibular left lacinia 11 dentate ..... ***Holopleustes*** n. g. (p. 82)
Antenna 1, peduncular segments regular, combined length > 1/2 segment 1; peraeopods 5-7 usually slightly unlike in size and form; mandibular left lacinia 6-7 dentate ..... 12.

12. Antenna 1 & 2, peduncular segments richly setose posteriorly; gnathopods 1 & 2 very weak, subsimilar, carpus longer than propod; coxa 1-3, posterodistal cusps very small ..... ***Heteropleustes*** n. g. (p. 74)
Antenna 1 & 2, peduncular segment devoid of setae; gnathopods regular, coxal cusps short to medium ... 13.

13. Antenna 1, peduncle 1 with posterodistal tooth; epimeral plate 3, hind corner with postero-distal "hook" .... *Pleusymtes* Barnard (sens. str.) (p. 59)
Antenna 1 peduncular segment 1 lacking posterodistal process; epimeral plate 3, hind corner squared, regularly acuminate or produced ..... *Pleusymtes mucida* (subgroup) (p. 68)

p. 40) provided a preliminary list of 16 species which they designated as "*Sympleustes*". The following species were excluded:

Sympleustes quadridens Bulycheva, 1955 which, according to the structure of the gnathopods and of the mandibular molar, has more recently been assigned to genus *Pleustoides* Gurjanova (Pleustoidinae). *Sympleustes quadrangularis* Margulis, 1963, and *S. similis* Margulis, 1963, are here included within *Pleusymtes*. *Sympleustes palmata* Margulis, 1963, is here transferred to *Pleustomesus* (p. 84).

Subgroups within genus *Pleusymtes* sens. str.

As outlined in the systematic analysis and key, the genus *Pleusymtes* Barnard presently encompasses 33 species in five taxonomically distinct subgroups; *P. glaber*, *P. pulchella*, *P. pacifica*, *P. pribilofensis*, and *P. mucida*. The *P. pribilofensis* subgroup exhibits character states trending to those of ***Rhinopleustes*** n. g., but is tentatively included within *Pleusymtes*, pending further study.

1. *Pleusymtes glaber* subgroup

Species: *Pleusymtes glaber* (Boeck, 1861) (Type species) (see also G. O. Sars 1893: 358, fig. pl .126.1; Bousfield 1973: 84, PL. XIV.2; Brunel et al, 1998:200; *Pleusymtes similis* (Margulis, 1963): 171, fig. 5;—Gurjanova 1972: 132,

Diagnosis: Antenna 1, peduncular segment 1 large, with posterodistal acute process; maxilla 1, inner plate with 2 apical setae; maxilliped palp, segment 2 distinctly longer than 1; coxal plates ordinary, deepening gradually posteriorly; gnathopods small to medium, palm with triangular tooth, merus of gnathopod 2 with posterodistal tooth; peraeopod bases (especially P7) modified; epimeral plate 3, hind corner with small hook; uropod 1, peduncle with distinct distolateral spine; uropods 2 and 3, outer ramus short (60% of inner); telson ordinary, not short.

Remarks: *Pleusymtes glaber* (Boeck), type species of the genus, was originally described from coastal waters of the eastern N. Atlantic. Material from the western N. Atlantic is similar, but usually shows only one apical seta on the inner plate of maxilla 1 (e.g. Bousfield 1973, plate XIV.2).

P. similis (Margulis) occurs from the western Laptev Sea (Tzvetkova & Golikov 1990) to the Sea of Okhotsk (Margulis 1963). Differences between *P. similis* and *P. glabroides*, noted by Margulis, are utilized here to place the two species within separate subgroups of genus *Pleusymtes*. In balance of character states, *P. similis* is least unlike *P. glaber*.

2. *Pleusymtes pulchella* subgroup

Species: *Pleusymtes pulchella* (G. O. Sars,1885). (see also Shoemaker 1955: 43; Brunel et al 1998: 200); *Pleusymtes margulisae* Tzvetkova & Golikov, 1990: 290, fig. 12.

Diagnosis: Antenna 1, peduncular segment 1regular, lacking posterodistal acute process; maxilla 1, inner plate with 2 apical setae; maxilliped palp, segment 2 distinctly longer than 1; coxal plates ordinary, deepening gradually posteriorly; gnathopods medium, palmar tooth weak or lacking, merus of gnathopod 2 with posterodistal tooth; peraeopod bases regular, broad; epimeral plate 3, hind corner square or slightly acuminate, not hooked; uropod 1, peduncle with distolateral spine; uropods 2 and 3, outer ramus regular (>60% of inner); telson elongate.

Remarks: The subgroup is relatively primitive and least remote from the *P. glaber* subgroup. Note that *Pleusymtes pulchella* (G. O. Sars) is very different from *Neopleustes pulchellus* (Kroyer), the type species of subfamily Neopleustinae.

3. *Pleusymtes pacifica* subgroup

Species: ***Pleusymtes pacifica*** n. sp. (p. 60); *P. derzhavini* (Gurjanova, 1938: 317, fig. 31); *P. subglaber* (Barnard & Given, 1960): 46, fig. 5; *P. buttoni* Dunbar, 1954: 757, fig. 28, 29; *P. quadrangularis* (Margulis, 1963):169, fig. 4; *P. quadrangularis brevipes* Ishimaru, 1985: 62, figs. 14-17.

Diagnosis: Antenna 1, peduncular segment 1 large, with posterodistal acute process; maxilla 1, inner plate with1 apical seta; maxilliped palp, segment 2 slightly longer than 1; coxal plates ordinary, deepening gradually posteriorly, hind corners of coxae 1-3 with single distinct cusp; gnathopods medium to stout, palm variously with triangular tooth and/or spines, merus of gnathopod 2 with acute posterodistal process; peraeopod bases regular, broad; epimeral plate 3, hind corner with small hook; uropod 1, peduncle with distinct distolateral spine; uropods 2 and 3, outer ramus regular (>60% of inner); telson medium to medium short.

***Pleusymtes pacifica* n. sp.**
(Fig. 9)

Pleusymtes sp. Staude 1996: 375, 379.
non *Sympleustes subglaber* Barnard & Given, 1960: 45;—Austin 1985: 590.
non *Pleusymtes glaber* Barnard 1969a (part): 425.

Material examined.
ALASKA:
Alaska: Aleutian Islands
Walrus Cove, Pebble I, St. Matthew I, sand, 10 m, P. Slattery coll., June 26, 1983 - 1 ♀ ov.
SE Alaska: ELB Stns:
1961: A81, Hawkins I., Orca Inlet (60° 33' N 145° 48' W) - 1 ♀ ov; A151, Islet 4.25 miles east of Johnstone Pt.(60° 28' N, 146° 28' W) - 2 im. A153, Mummy I, Orca Inlet (60° 28'N, 145° 59' W) - 2 im.
1980: S21 L1, Rokof I., Baranof Island (56° 45.5' N, 135° 18.5' W), 4.5-13 m. dive, Aug. 3, 1980 - 1 ♂ (3.3 mm) **holotype** (slide mount), CMNC 2004-0129; Ibid., 3 ♀♀, 2 imm **paratypes** CMNC 2004-0143.

BRITISH COLUMBIA:
Queen Charlotte Islands, ELB Stns, 1957:
E14a, Onward Pt., Moresby I (N, W), exposed shore, July 13 - 3 im.
North Central Coast, ELB Stns, 1964:
H23, Deadman's Cove (53° 38'N, 129° 28'W), 3-4 m, July 18 - 4 im; H22, Banks I., 1/2 mile off north end (53° 39' N, 130° 34' W), 20 m, July 17 - 1 ♂ (slide mount), 1 ♀ + ~100 im; H8, Joachima Bay (53° 49'N, 130° 38'W) 1 ♂, 9 ♀♀ ov.

Northern Vancouver I., ELB Stns, 1959:
V3, Nahwitti Bar, Hope I. (50° 55' N, 128° 02'W), 60 m., "A. P. Knight" dredge, July 13 - 1♂, 7 ♀♀, 2 im.

Diagnosis: Male (3.3 mm). Body smooth. Urosome 2 nearly occluded dorsally. Rostrum short, little exceeding triangular anterior head lobe; anteroventral corner of the head acute. Eye large, subrotund. Antenna 1 elongate; peduncular segment 1 elongate, with posterodistal acute tooth or spine; peduncular segment 2, length ~ 1/2 segment 1,and ~2x short segment 3; alternate segments of flagellum posterodistally with aesthetascs and short setae; accessory flagellum minute, triangular, with long strong apical setae, 1 plumose seta and smaller setae. Antenna 2 much shorter than antenna 1; flagellum ~23-segmented.

Upper lip apically bilobed, lobes nearly symmetrical. Lower lip, inner lobes sloped; outer lobes rounded, not widely separated. Mandible, incisors with 6-7 teeth; left lacinia 8-9-dentate, right lacinia absent; accessory spine rows with 8-9 slender blades; molar columnar, with "pavement" type ridged grinding surface; palp, segment 3 slightly longer than segment 2, inner margin distally with ~8 "E" setae, and 3-4 long apical pectinate setae. Maxilla 1, inner plate narrow, with 1 apical pectinate seta; outer plate with 9 multi-cusped spine-teeth; palp slender, exceeding outer plate, rounded apically, with 5 apical/subapical spines and 6 lateral setae; basal segment lacking marginal seta(e). Maxilla 2, inner plate short, broad, inner marginal stout seta separated from apical setae. Maxilliped, inner plate subovate, short, with 3 apical buttn spines and 3 long setae; outer plate with 1 apical dorsal spine;palp segment 3 distinctly longer than 2; dactyl slender, slightly curved, shorter than segment 3.

Coxal plates 1-4 medium, deep, subrectangular, increasing gradually posteriorly. Coxae 1-3 each with single medium posterodistal cusp. Coxae 5 & 6 shallowly posterolobate. Coxal gills small, saclike.

Gnathopods regular, subsimilar in form, dissimilar in size. Gnathopod 1, carpus medium short; propod sub-ovate, palmar margin as in gnathopod 2. Gnathopod 2, merus with distinct posterodistal tooth; carpus short, posterior lobe narrow; propod subovate; palmar margin smoothly and obliquely convex, with submedial tooth; posterodistal angle with 2 clusters of long and short spines, posterior margin nearly bare; dactyl slender.

Peraeopods 3 & 4 slender, segment 5 not shorter than 4, dactyls medium short. Peraopods 5-7 increasing slightly posteriorly, bases broadening posteriorly, rounded behind, posterodistal lobes shallow.

Epimeral plate 3, hind corner produced in a small but distinct "hook". Uropod 1, inner ramus longer than peduncle, distinctly longer than outer ramus. Uropod 2, inner ramus ~1/3 shorter than inner ramus. Uropod 3, outer ramus 60% inner ramus, apices unarmed.

Telson linguiform, little longer than broad, keeled slightly proximally; apex rounded, with 2 subapical notches; paired penicillate setae about mid point on each side.

Etymology: The name recognizes the northeastern Pacific region of the species occurrence.

Distributional Ecology: Aleutian Islands, through southeastern Alaska to northern B. C; shallow subtidal to more than 60 m in depth,

Remarks: Barnard & Given (1960) gave species recognition to the southern California form initially as *Sympleustes subglaber*. However, the mouthparts were not fully described nor fully figured, and material was not available for this study. *P. pacifica* differs from *P.*

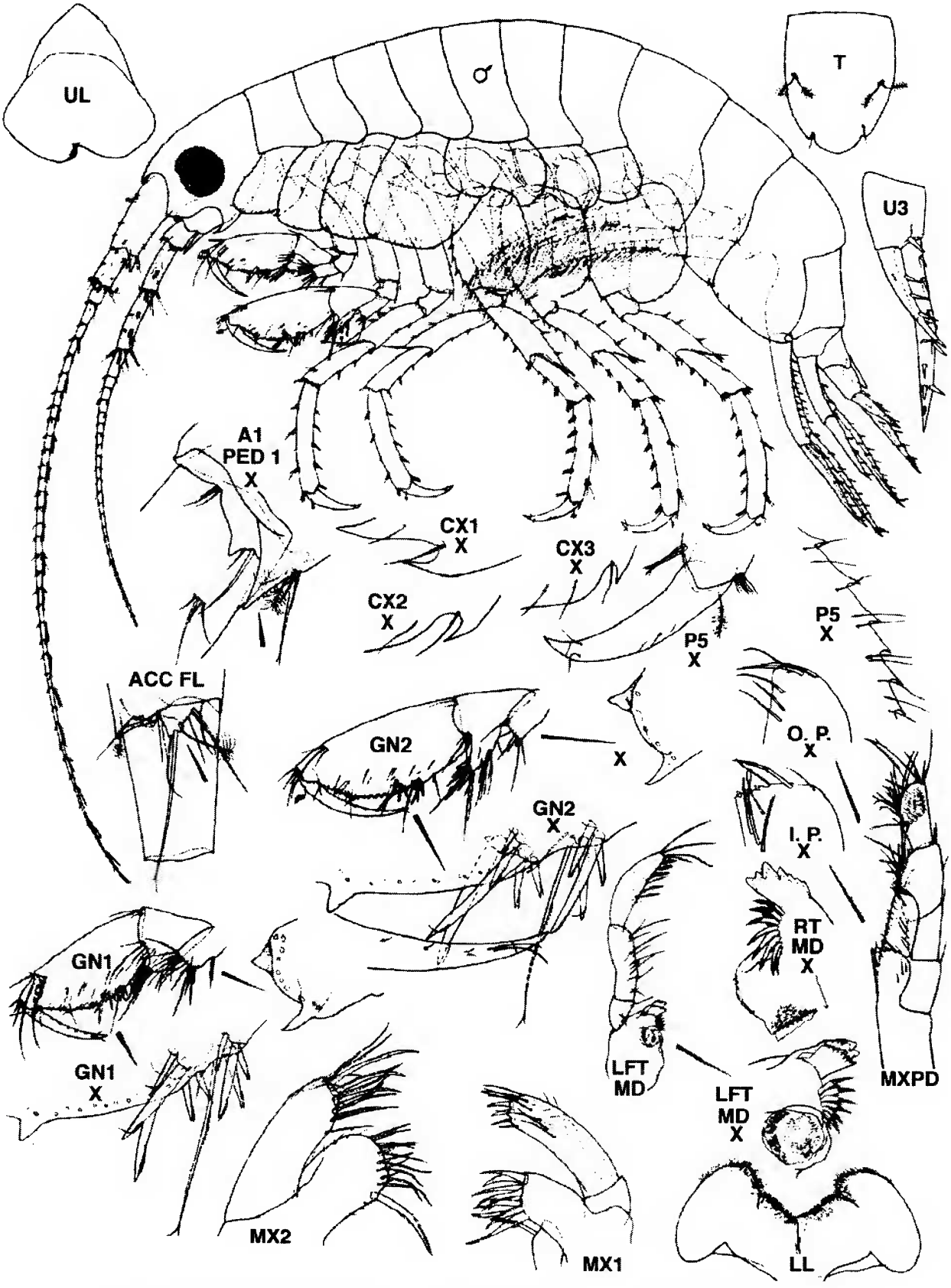

Fig. 9. ***Pleusymtes pacifica*** n. sp. Male (3.3 mm). Baranof Island, SE Alaska.

subglaber mainly in the longer peduncular segment 1 of antenna 1, more pronounced posterodistal cusp of coxae 1-3, less strongly acute hind corner of epimeral plate 3, shorter outer ramus of uropod 2, and shorter telson.

4. *Pleusymtes* ***pribilofensis*** subgroup

Sympleustes (part): Dunbar 1954: 652.
Pleusymtes (part) Just, 1980: 40.—Ishimaru 1985: 43 —Barnard & Karaman 1991: 652.

Species: ***Pleusymtes pribilofensis*** n. sp.; *P. glabroides* (Dunbar, 1954); *P. uncigera* (Gurjanova, 1938); *P. palmata* (Margulis, 1963)?; *Pleusymptes* sp. (= *Sympleustes uncigera* Shoemaker 1955).

Diagnosis: Body dorsally smooth. Urosome 2 dorsally occluded or nearly so. Rostrum medium, not exceeding acute anterior head lobe. Antenna 1, peduncular segment 1 elongate, with acute posterodistal process, laxking anterodistal process; segments 2 & 3 short. Accessory flagellum minute, rounded apically.

Mouthparts much as in ***Rhinopleustes***. Mandibular left lacinia 7-8 dentate; blades of spine row somewhat thickened or molarized, 6 on each side.

Coxal plate 1, anterior margin variously concave, distal portion bent forwards. Coxae 2-4 sharply deeper and larger than coxa 1, not as deep as in *Rhinopleusttes*. Coxae 1-4 with medium large single posterodistal cusp. Coxal gills small, sac-like ,on peraeopods 2-6.

Gnathopods medium strong, subsimilar in form; bases with weak marginal setation; carpus medium long, lobes shallow. Gnathopod 2 larger, merus with posterodistal tooth.

Peraeopods 5-7 subsimilar; bases increasing in width posteriorly; hind margins straight or rounded, variously posterodistally sharply angled; dactyls medium strong.

Epimeral plate 3 acute, not strongly produced. Uropod 1, peduncle with distolateral spine; outer ramus distinctly shorter than inner. Uropod 2, outer ramus short, ~2/3 inner ramus. Uropod 3, outer ramus ~1/2 inner ramus.

Telson elongate, distally narrowing, and apically rounded; marginal penicillate setae slightly proximal.

Remarks: This group, lacking only dorsal body carinations and processiferous antenna 1, appears transitional to genus ***Rhinopleustes.***

Pleusymtes pribilofensis n.sp.
(Figs. 10, 11)

Material examined.
ALASKA:
Pribiloff I., Bering Sea, D. B. Quayle coll., Nov. 23, 1965- 1 ♀ br. II (4.5 mm) **holotype** (slide mount), CMNC 2004-0127; 1 ♀ br. I (4.1 mm) **paratype**, CMNC 2004-0128.

Diagnosis: Female br. II (4.5 mm). Body smooth. Rostrum short, about 0.2x peduncular segment 1 of antenna 1, apex pointed; anterior head lobe triangular, lateral cephalic lobe deeply recessed sinus, anteroventral corner of the head acute. Eye medium, pigmented. Antenna 1 long, about 0.66x body length, peduncular segments; peduncle 1 strong, elongate, posterior margin with stout acute spine, length of peduncle 2 about 2.3x peduncle 3; flagellum length about 3.3x peduncle, ~39-segmented, posterodistally with aesthetascs and short setae; accessory flagellum minute, with apical strong setae and smaller setae. Antenna 2 shorter than antenna 1, flagellum ~30-segmented.

Upper lip, labrum bilobed, strongly asymmetrical. Lower lip, outer lobes rounded and fairly close together, mandibular process rounded, lacking inner lobes. Mandible, incisor margins with 7 teeth; left lacinia mobilis 7-dentate, right lacinia absent; accessory spine rows with 6-7 slender blades; molar columnar, triturative, surface lacking ridges; palp, segment 3 curved, slightly longer than segment 2, inner margin totally lined with long strong pectinate setae, 2 long apical strong pectinate setae and 1 long setae, segment 2, inner margin with long setee, segment 1 about 0.3x segment 2. Maxilla 1, inner plate rounded; spine-teeth of outer plate slender, multi-cusped; palp rounded apically, with 5 apical spines and 6 setae; segment 1 with 1 distolateral seta. Maxilla 2, inner plate shorter and broader than outer plate; inner marginal plumose setae inserted proximal to apical setae. Maxilliped, inner plate subquadrate, short, barely reaching base of palp segment 1,truncate apex with 4 button spines and 3 long setae,inner margin with 6 long setae; outer plate slender, reaching about 0.33x length of palp segment 2, apex subtruncate, with 4 setae; palp segment 2 longer than segments 1 and 3; dactyl slender, slightly curved, with facial micropectinations, length > segment 3.

Coxae 1-3 each with strong posterodistal cusp; coxae 2-4 deeping abruptly beyond shorter coxa 1. Coxa 4, lower and posterodistal margins nearly straight. Coxae 5-6 shallowly posterolobate; coxa 7 rounded below.

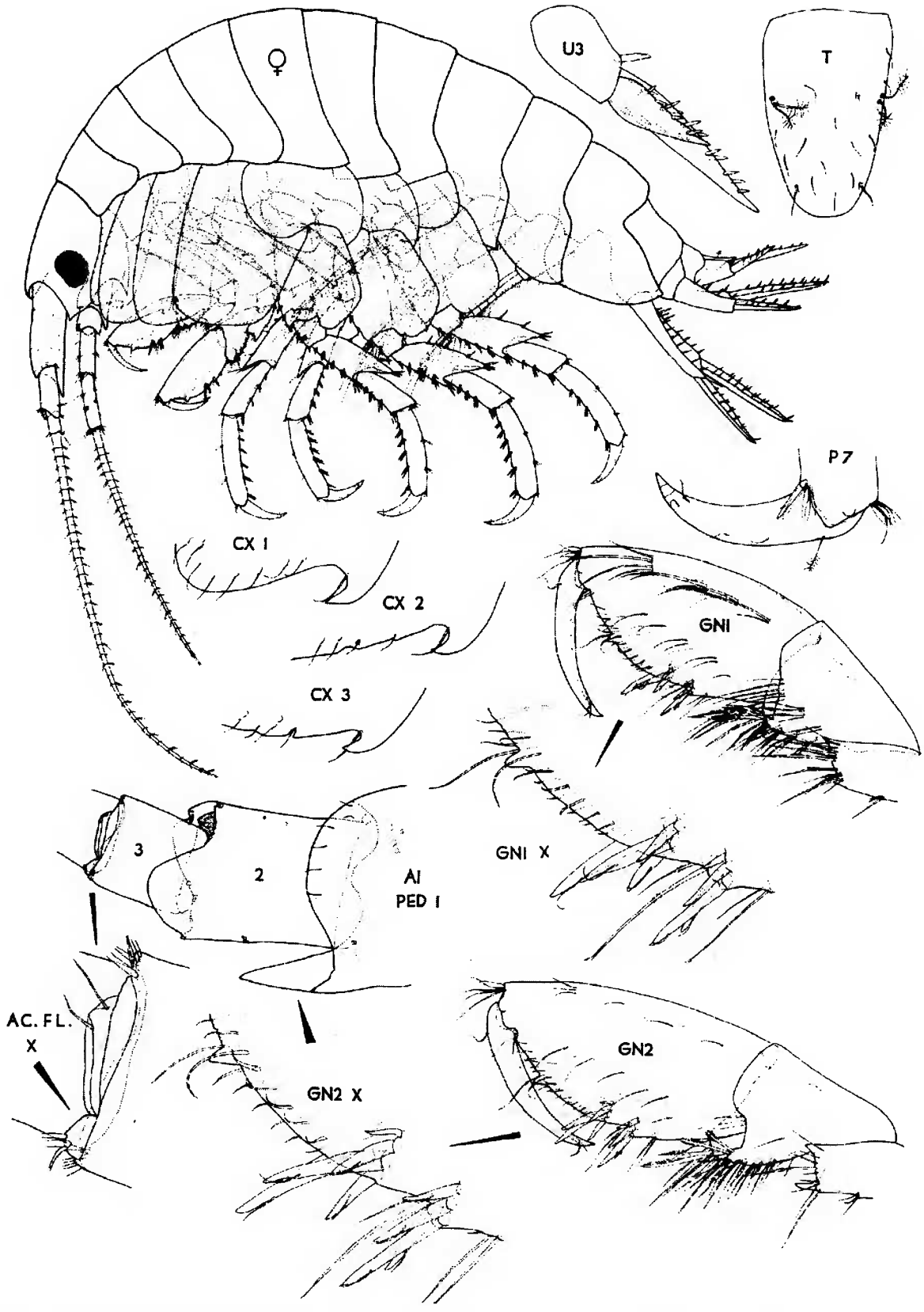

Fig.10. *Pleusymtes* ***pribilofensis*** n. sp. Female br. II (4.5 mm). Pribilof I. Bering Sea. Alaska.

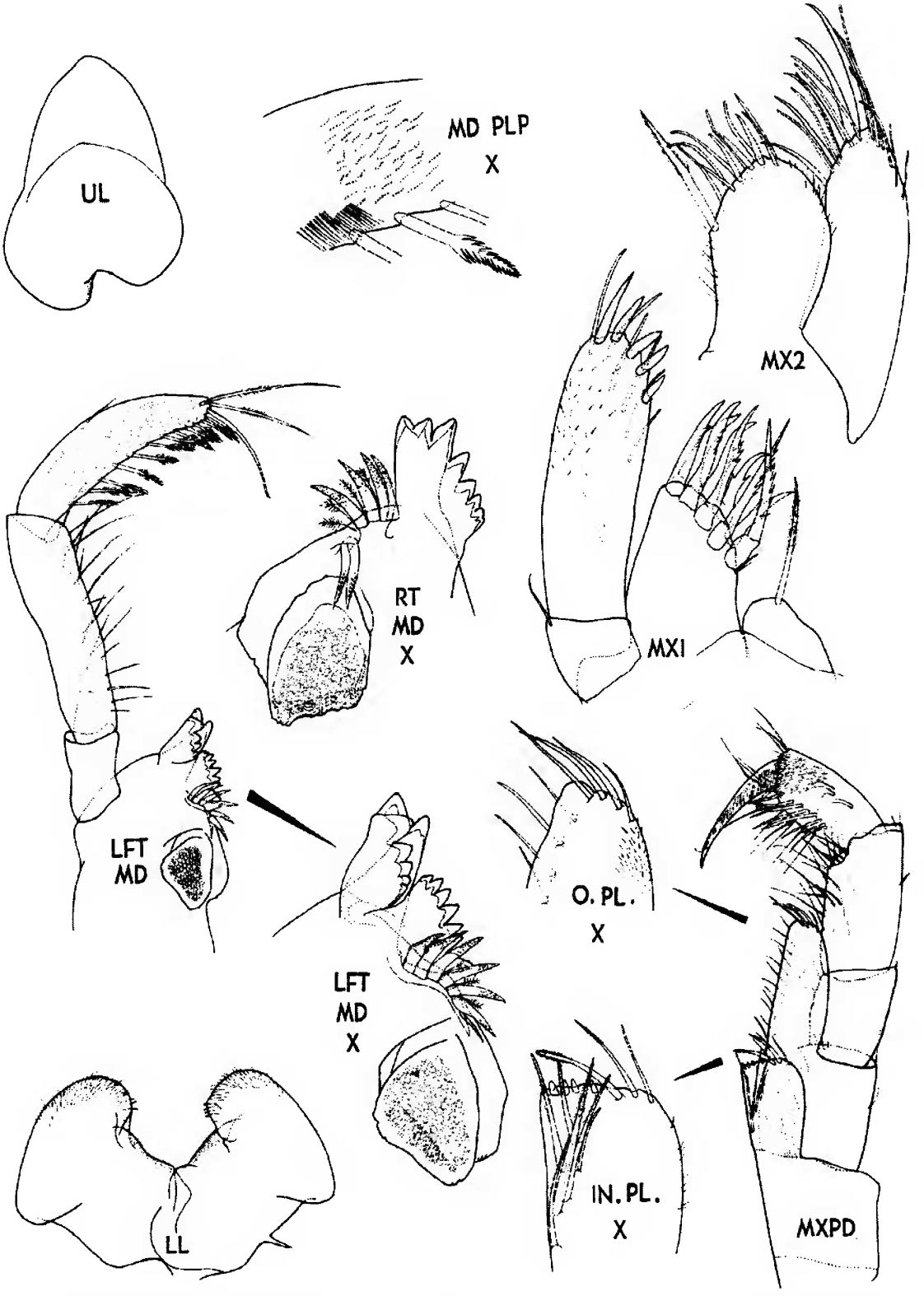

Fig. 11. ***Pleusymtes pribilofensis*** n. sp. female br. II (4.5 mm). Pribilof I. Bering Sea, Alaska.

Coxal gills short, sac-like, increasing slightly in size posteriorly.

Gnathopod 1, carpus long, length about 0.6x propod, posterior lobe medium broad, little produced; propod subovate, with 4 groups of anteromedial facial setae; palmar margin smoothly convex, oblique, with median tooth, posterodistal angle with 2 clusters of slender spines, posterior margin with 1 distal seta group; dactyl slender. Gnathopod 2 subsimilar, larger; meral tooth prominent, acute; carpal lobe produced slightly along propodal margin; propod with few facial setae, palmar mrgin and dactyl as in gnathopod 1.

Peraeopod 3-4, basis length about 2.3x width, anterior margin with short setae; merus posterodistally acute, anterior margin setose; carpus about equal to merus; propod longest, posterior margin with 5-6 pairs of short spines ; dactyl relatively short. Peraeopods 5-7 medium stout, bases homopodous; hind margin nearly staight, angling sharply to shallow posterodistal lobe; segments 4-6, anterior margins with clusters of short spines.

Epimeral plate 3, ventral margin smooth, hind corner acute, not produced. Pleopods, powerful, normal. Uropod 1, peduncle, slightly > outer ramus, margins with short spines, outer ramus slightly < inner ramus, margins serially spinose. Uropod 2, peduncle and outer ramus subequal in length, margins with short spines, outer ramus about 0.6x inner ramus, margins serially spinose. Uropod 3, peduncle short, length subequal to outer ramus, with 1 posterodistal spine; outer ramus, length about 0.6x inner ramus, with 4 pairs of marginal spines; inner ramus with 8-9 pairs of spines.

Telson elongate, linguiform, apically rounded, length about 1.7x width,with median ventral keel, plumose marginal penicillate setae inserted slightly proximad of mid point.

Etymology: The name refers to the type locality of the species in the Pribilof Islands, Bering Sea.

Distributional ecology: Known only from shore locations on the Pribilof Islands. Ecology unknown.

Remarks: *Pleusymtes pribilofensis* differs from ***Rhinopleustes*** in its smooth, uncarinated body segments, less posteriorly produced epimeral plates, and ordinary antennal peduncular segment 1 that lacks a strong anterodistal process (see keys, p. 66).

Pleusymtes uncigera (Gurjanova)?
(Fig. 12)

Sympleustes uncigera Gurjanova, 1938: 320, fig. 33;—Gurjanova 1951: 661, fig. 455.
Pleusymtes uncigera Tzvetkova & Kudryaschov 1985: 5 (part?);—Barnard & Karaman 1991: 652.
non *Sympleustes uncigera* Shoemaker 1955: 43, figs. 14c-e.

Material Examined:
ALASKA:
Brothers I., Frederick Sound, 5-7 m., P. Slattery coll., Mar. 24, 1988 - 5 ♂♂, 1 ♀ ov. CMN collns.

BRITISH COLUMBIA:
North Central coast, Swanson Bay, C. Levings Stns. 1973, 51B series, Apr. 4 : 025 - 3 im; 028 - 1 im; 029 - 2 im; 1975, 51B series, Nov. 18,: -007 - 9 im; -009 - 28 im; -010 - 1 im; -011 -17 im (slide mount); -012 - 10 im; -013-12 im. CMN collns.

Remarks: Present material from Swanson Bay, B. C., is lacking the distal portion of the antenna and peraeopods 3-7. However, in size, depth range, and character states of coxal and epimeral plates, proximal portions of appendages, and mouthparts, our material is closely similar to that of Gurjanova (loc. cit.) from the northern Sea of Japan and Sea of Okhotsk (Fig. 12). Material sparsely encountered from low intertidal and shallow subtidal habitats on the south Sakhalin shelf, examined by Tzvetkova & Kudrjaschov (loc. cit.), ranged in size to 5 mm for females and 7 mm for males.

Pleusymtes glabroides (Dunbar)
(Fig. 13A)

Sympleustes glabroides Dunbar, 1954:753, fig. 30; *Pleusymtes glabroides* Just 1980: 44, fig.41;—Barnard & Karaman 1991: 652.

Remarks: The species is not far removed from *Pleusymtes* subgroup 1 in having bases of peraeopods 5-7 smoothly rounded behind, rather than angular.

Features of the upper and lower lip, right mandible, maxilla 2, coxal gills and pleopods have not yet been described and figured.

Key to Species of *Rhinopleustes* and the *Pleusymtes pribiloffensis* subgroup

1. Posterior peraeonal segments and pleon segments middorsally carinate; antenna 1, peduncular segment 1 with strong anterodistal process overhanging peduncular segment 5; mandibular spine row with 9-10 blades . . . . . ***Rhinopleustes acuminatus*** n. sp (p. 70)
   Body segments dorsally smooth or nearly so; antenna 1, peduncular segment 1 lacking anterodistal process; mandibular spine row with 6-7 blades . . . . . *Pleusymtes* subgroup 4 . 2.

2. Antenna 1, peduncular segment 2 normal, length ~1/2 segment 1; peraepods 5-7, posterior margin of bases angular , not smoothly convex; western . . . . . 3.
   Antenna 1, peduncular segment 2 short, length ~1/3 segment 1; peraeopods 5-7, bases more or less rounded behind; eastern . . . . . *P. glabroides* (Dunbar) (p. 65)

3. Eye short reniform; peraeopods 5-7. posterodistal lobes of bases rounded . . . . . ***P. pribilofensis*** n. sp. (p. 62)
   Eye subtriangular; peraeopods 5-7 posterodistal lobes sharply angular . . . . *Pleusymtes* sp. (Shoemaker) (p. 68)

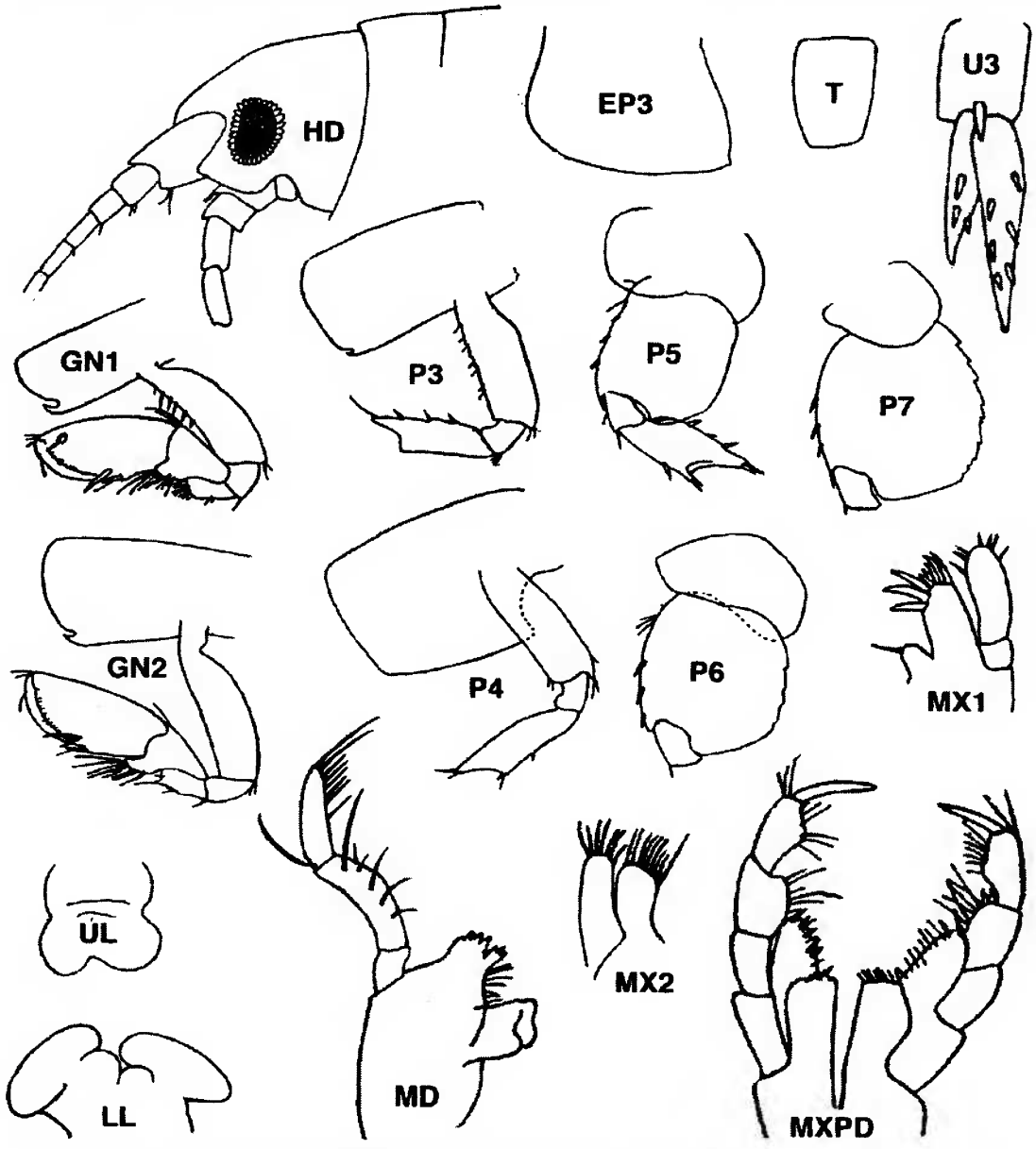

Fig. 12. *Pleusymtes uncigera* (Gurjanova)? Female (4.0 mm). Northern Sea of Japan, 50 m. (modified from Gurjanova 1938)

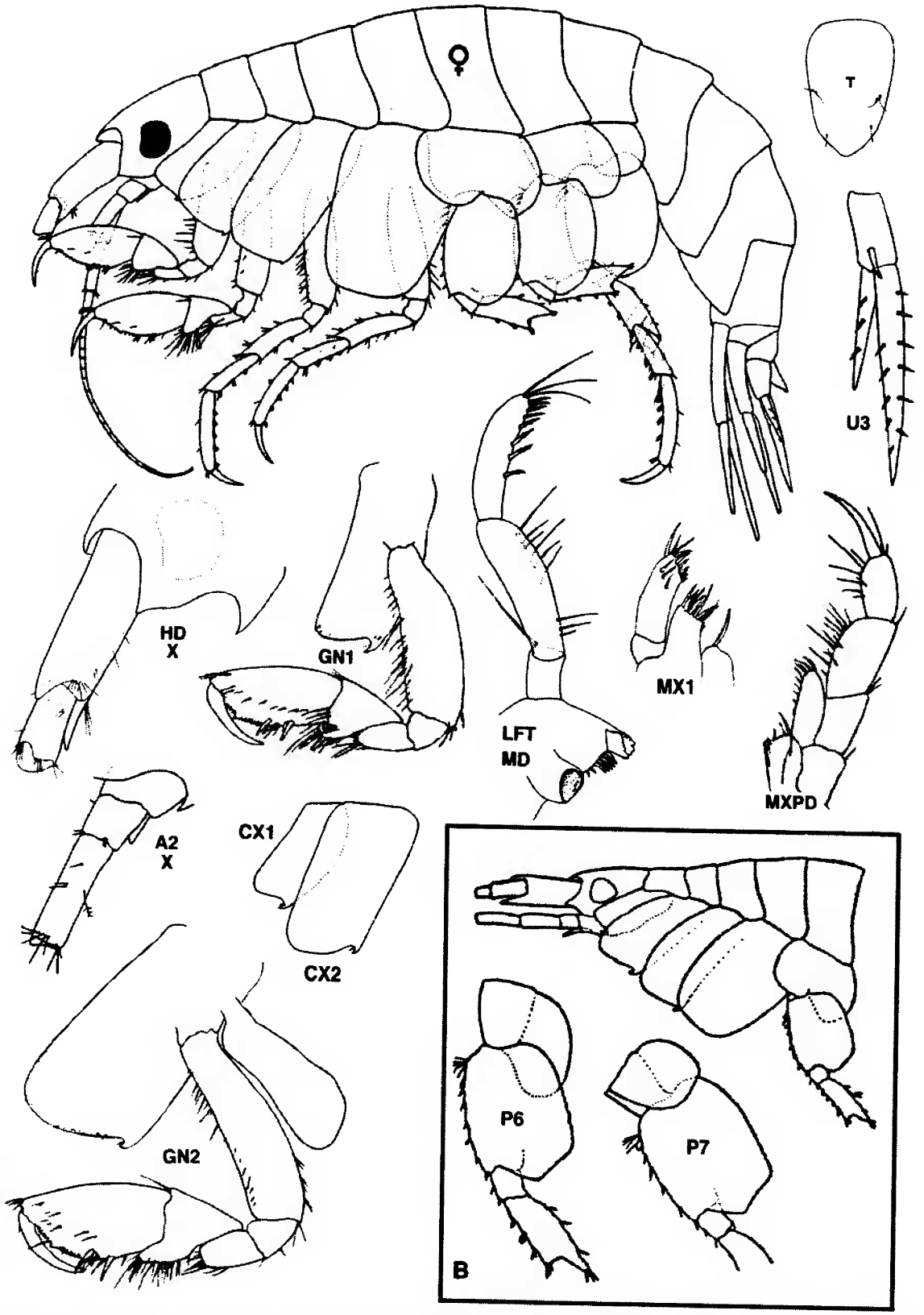

Fig. 13. A. *Pleusymtes glabroides* (Dunbar, 1954) Female ov (4.3 mm); head of largest female (7.1 mm). East Greenland (after Just 1980). GN1, GN 2, MX1, MXPD from 7.5 mm female, Ungava Bay (modified from Dunbar 1954). Inset B. *Pleusymtes* sp. = *Sympleustes uncigera* Shoemaker, 1955,

However, material of *P. glabroides* from the St. Lawrence estuary near the Saguenay fiord (Ile Alouette) conforms closely with generic character states of mouthparts, antenna 1, coxal plates and uropods. The telson is apically truncate rather than rounded.

Pleusymtes sp.
(Fig. 13B)

Sympleustes uncigera Shoemaker 1955: 43, figs. 14c,e

Remarks: Shoemaker (loc. cit.) ascribed material from off Pt. Barrow to *Sympleustes* (=*Pleusymtes*) *uncigera* Gurjanova, 1938, a decision presumably based on the squared posterior margins of the bases of peraeopods 5-7. However, his figures and description of the large distally acuminate antennal peduncular segment 1, small coxa 1 that is anterodistally flexed, and large posterodistal cusps on coxa 1-3, are similar to those of the *pribilofensis* subgroup of *Pleusymtes*.

Shoemaker's material appears distinct from the three other species treated herein (key, p. 66) and may be new to science. However formal naming of this species cannot be completed until further material is obtained and re-examined.

5. Pleusymtes mucida subgroup (present designation)
(Fig. 14)

Species: *Pleusymtes mucida* Ishimaru, 1985; *P. japonica* (Gurjanova,1938); *P. kariana* (Stappers, 1911); *P. karstensi* (Barnard, 1959); *P. ochrjamkini* (Bulycheva, 1952); *P. suberitobia* (Gurjanova, 1938); *P. uschakovi* (Bulycheva, 1952).

Diagnosis: The subgroup encompasses species that bear some similarity to *P. mucida* but are otherwise of uncertain status because of limitations in the original and/or subsequent descriptions.

Antenna 1, peduncular segment 1 regular, apparently lacking posterodistal acute process.

Maxilla 1, inner plate with single apical setae. Maxilliped, inner plate with 3-4 apical button spines; palp, segment 2 variously longer than 1.

Coxal plates 1-4 rounded or squared below; coxa 1 may be slightly bent forwards distally, and abruptly smaller than coxae 2-4; hind corner of coxae 1-3 with single notch.

Gnathopods medium to strong; palmar tooth weak or lacking; carpus short to medium; merus of gnathopod 2 with posterodistal tooth.

Peraeopods 5-7, bases usually broadly rounded but may be narrowed, with shallowly convex posterior margin (e.g., *P. karstensi* (Barnard)).

Epimeral plate 3, hind corner square or slightly acuminate, not "hooked". Uropod 1, peduncle with distolateral spine. Uropods 2 and 3, outer ramus regular (usually >60% of inner). Telson medium to short.

Remarks: The *P. mucida* subgroup designated here is a somewhat all-inclusive complex of species that are, however, well separated from other pleusymtinid genera that have been attributed by several authors to *Pleusymtes* sensu Barnard. In balance of character states, *Pleusymtes mucida* Ishimaru may best typify this variable subgroup (Fig.14).

Also tentatively placed within the *P. mucida* subgroup are the presumed arctic species *P. karstensi* (Barnard, 1959) and *P. kariana* (Stappers, 1911). The first bears a superficial resemblance to *P. glabroides* but differs in its short, non-processiferous antennal peduncular segment 1, more elongate gnathopods, and narrow peraeopod bases. In the second instance, Shoemaker's illustration (1955, fig. 14f) of a small weakly setose gnathopod 1 suggests alignment within the more specialized genus *Heteropleustes* (p. 74). Gurjanova's more complete description of Stappers' species denotes a plesiomorphic condition of the mandibular molar, maxilliped outer plate and elongate outer ramus of uropod 3.

Cognizant of limitations in some original descriptions and in marginal regional pertinency, plus the unavailability of study material for most species, we have not attempted to recognize their character state differences at higher taxonomic levelS, nor included them in species keys.

? *Pleusymtes* sp. 1

Material Examined:
BRITISH COLUMBIA
S. Vancouver Island: ♀
Victoria region, B. C., LW, C. Low coll., Jan 24, 1981 - 1 ♂ (3.5 mm). CMN colIns.

Remarks: This single small specimen is perhaps closest to *P. okrjamkini* (Bulycheva, 1952), in having: antenna 1, peducular segment 1 with very small posterodistal tooth; accessory flagellum small but distinct; gnathopods stout, with toothed palmar margin, and carpus medium broad ; coxal plate 1 slightly bent forwards, with medium large posterodistal cusp; peraeopods 5-7, bases broadly rounded behind; and epimeral plate 3 with acutely produced hind corner.

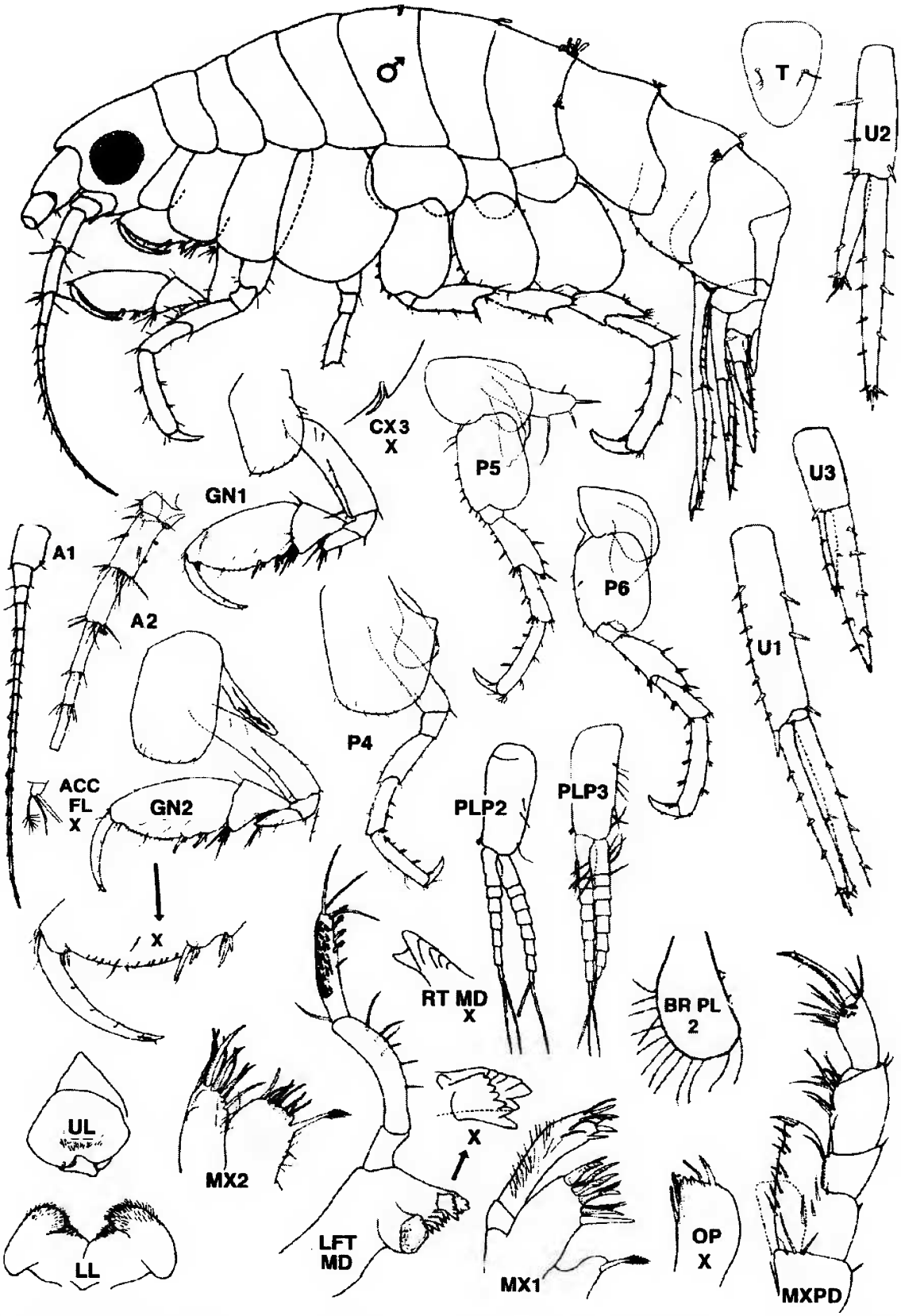

Fig. 14. *Pleusymtes mucida* Ishimaru. Female ov (2.8 mm). Shallow subtidal, Oshoro, Hokkaido, Japan. (modified from Ishimaru 1985)

?*Pleusymtes* sp. 2

Material Examined:
ALASKA
Aleutian Islands:
Amchitka I., S. Makarius Bay, K. Kimura coll., Feb 8, 1968 - 1♀ ov (6 mm) CMN collns. Constantine Hbr, at dock, P. Slattery coll. Sept. 21, 1969 - 1 ♂ (4.5 mm); Ibid - 1specimen, CMN collns. Constantine Hbr., C. E. O'Clair coll., 1969 - 1 ♂ (5.2 mm), CMN collns.

Remarks: The species has most of the character states of sp. 1 (above): coxa 1 bent anterodistally, with medium posterodistal cusp; gnathopods large, heavy, subsimilar in form. Species 2 is unlike species 1 in the following: mandibular left lacinia is 8-dentate; right lacinia absent, 3 distal blades are apically broadened and bifid; epimeral plate 3, hind corner is squared, slightly acuminate but not produced.

Rhinopleustes n. g.

Type species: ***Rhinopleustes acuminatus*** n. sp. (monotypy).

Diagnosis: Body dorsally carinated on pereon segments 5-7 and pleon segments 1-2. Urosome segment 2 occluded dorsally. Head, rostrum prominent; anterior head lobe prominent, acute. Eyes medium, subreniform. Antenna 1, peduncular segment 1 enlarged, with large anterodistal and posterodistal acute processes; peduncular segments 2 & 3 very short; accessory flagellum minute, triangular. Antenna 2 distinctly shorter than antenna 1; peduncular segments with facial groups of short setae; peduncular segment 2 with small sharp anterodistal process.

Upper lip, apical lobes strongly asymmetrical. Lower lip, inner lobes weak, obliquely sloped. Mandible, left lacinia 8 dentate, right lacinia lacking; molar strong, with pavement-type grinding surface. Maxilla 1, inner plate with 1 apical seta; outer plate with 9 apical spine teeth; palp large, with 6 apical spines; proximal segment with outer marginal seta(e). Maxilla 2, inner plate broadly triangular, strong inner marginal seta inserted close to shorter apical setae. Maxilliped, inner plate broad, with 6-8 apical button spines; outer plate narrow; palp strong, segment 2 longer than 1; segment 3 subequal in length to dactyl.

Coxal plates 2-4 very deep, sharply increasing beyond shorter coxa 1. Coxa 1 with slightly concave anterior margin; coxae 1-3 each with single large posterodistal cusp. Coxa 5-6 posterolobate. Coxal gills large, sac-like.

Gnathopods 1 & 2 medium strong, similar in form, gnathopod 2 slightly the larger. Palmar margin of propod smoothly oblique, with medial tooth and two clusters of posterodistal spines; carpus, posterior lobe medium; merus of gnathopod 2 with distinct posterodistal tooth.

Peraeopods 3-4 medium stout; segment 5 slightly shortest; dactyls relatively short. Peraeopod 5-7 subsimilar in form; peraeopod 5 shortest; bases broadened, sharply angled posterodistally.

Epimeral plates 1-3 acutely produced posteroventrally, hind corner of 3 produced. Pleopods normal. Uropod 1, peduncle with distolateral spine. Uropods 2 & 3, outer ramus the shorter.

Telson linguiform, rounded distally, length 1.5x width; paired penicellate setae at midmargin.

Etymology: Combining the Greek *rhinos* (nose, snout) and the generic root *pleustes*, with reference to the strongly elongated anterodistal process of peduncular segment 1 of antenna 1; gender masculine.

Remarks: *Rhinopleustes* is distinguished from all other pleustid genera by the following combination of character states: peraeon segments 5-7 and pleon segment 1-2 dorsally carinate; anterior head lobe narrowly acute; antenna 1, peduncular segment 1 with strong anterodistal process; maxilliped, inner plate with 6-8 button spines; peraeopods 5-7, bases with sharply angled or truncated postero-distal lobe (see also key, p. 58).

Rhinopleustes acuminatus n.sp.
(Fig. 15)

Material examined:
ALASKA
Pribilof Islands, Bering Sea, D. B. Quayle coll., Nov. 23, 1965 - 1♀ (6.7 mm) **holotype** (slide mount), CMNC 2004-0125; Ibid.,- 1♀ br. 1 (5.9 mm) (slide mount), 1♀ (undissected) **paratypes**, CMNC 2004-0126.

Diagnosis: Female (6.7 mm). Posterodorsal carinations on peraon segment 5-7 and pleon segments 1-2 low, acute. Pleon segment 3 raised middorsally, convex. Head as deep as long; rostrum acute, length 0.4x peduncle 1 of antenna 1, anterior head lobe narrowly produced, acute; inferior antennal sinus deep, hind corner acute. Eye subreniform. Antenna 1, length 0.5x body length; peduncular segment 1 as long as head, with acute anterodistal process covering segment 2, and smaller sacute posterodistal process; peduncular

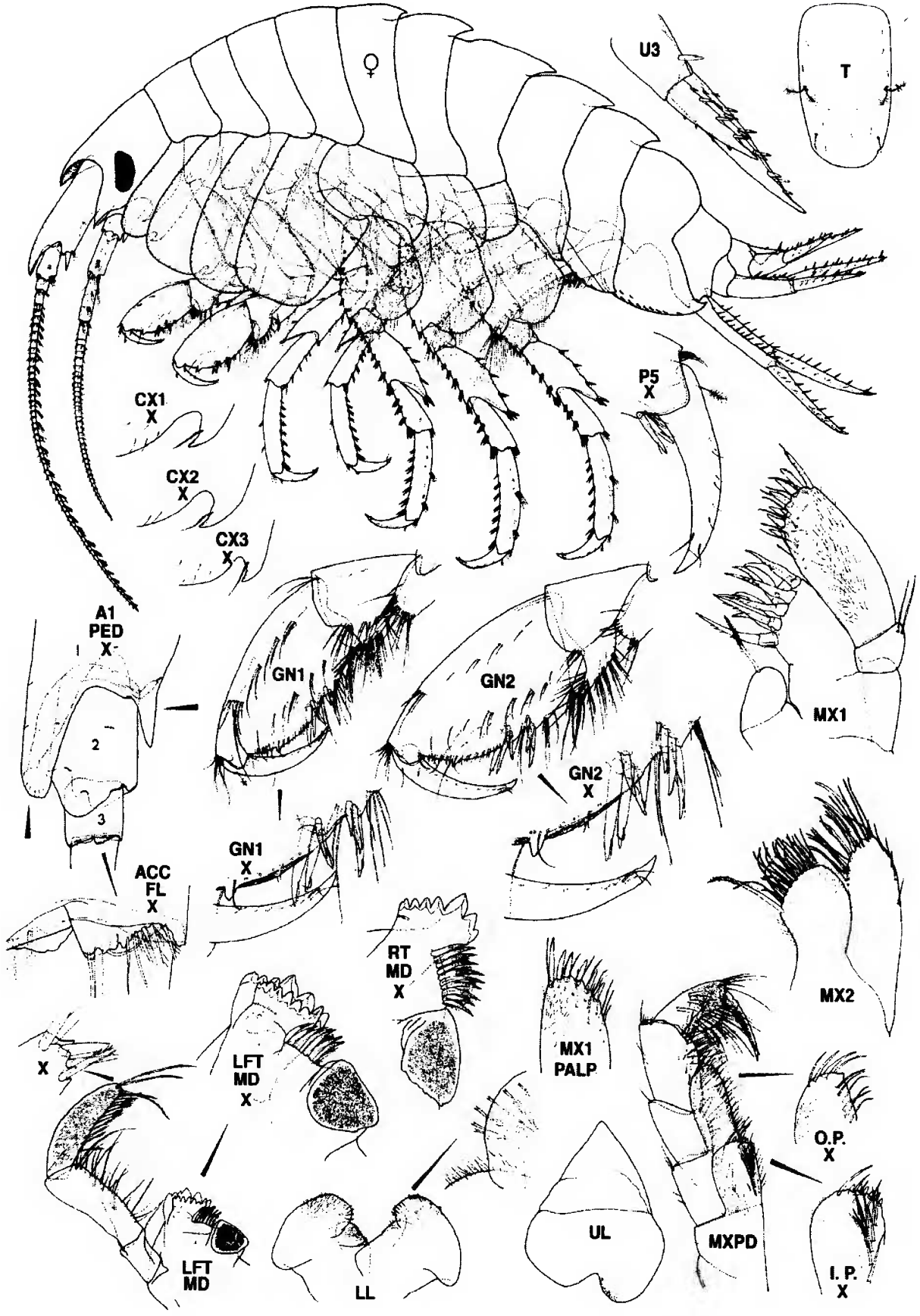

Fig.15. ***Rhinopleustes acuminatus*** n. sp. Female br. I (5.9 mm.) Pribilof Island, Bering Sea,Alaska

segments 2 & 3 very short, combined length 0.47x peduncle 1; accessory flagellum with apical setae; primary flagellum length ~56-segmented, posterodistally with aesthetases and short setae. Antenna 2 short; length 0.7 x antenna 1; peduncular segment 2 with acute anterodistal process; peduncular segments 4 & 5 subequal; flagellum ~35-segmented.

Upper lip, apical lobes strongly asymmetrical. Lower lip, outer lobes rounded not widely spread. Mandible, incisors 7 dentate; left lacinia mobilis 7-8 dentate; accessory spine rows with 7-10 slender blades; molar columnar, triturative, surface slightly textured but not ridged; palp, segment 1 relatively long, 0.4x segment 2; segment 2, inner face lined with medium setae; segment 3 curved, slightly longer than 2, with basally inserted single stout A seta, inner margin lined with ~12 D setae, apex with 4-5 long pectinate E setae. Maxilla 1, inner plate ovate; outer plate with 9 multi-cusped spine-teeth; palp extending beyond outer plate, segment 2 with 7 slender apical spines and ~9 distolateral setae, segment 1 with 2 distolateral setae. Maxilla 2, inner plate broadened, shorter than outer plate; outer plate apically with simple setae and 2-3 bladelike setae. Maxilliped, inner plate short, broad, reaching base of palp, with 7-8 apical button spines in the larger paratype female; outer plate narrow, elongate, rounded apically, reaching about 0.5x length of palp segment 2, inner margin setose, apex subacute, with 4 strong setae; palp segment 2 longest; segment 3 narrower; dactyl slender, curved, slighter shorter than segment 3.

Coxal plates 1-3 subrectangular, very deep, lower margins nearly straight; coxa plate 4 much broader, excavate posteroproximally; coxal plates 5-7 shallowly posterolobate; coxa 7 subquadrate.

Gnathopod 1, basis, anterior margin setose; merus with small posterodistal tooth; carpus medium, length about 0.6x propodus, posterior shallow, setose; propodus subovate, palm smoothly oblique, with 4 stout clusters of anteromedial setae; dactyl closing on first posterodistal group of spines. Gnathopod 2 subsimilar; merus with short posterodistal tooth; carpal lobe short, produced slightly forwards along posterior margin of propodus.

Peraeopod 3-4, anterior and posterior margins of basis with short setae; merus 1.1x carpus; propodus 1.5 x carpus, posterior margin with 7-8 clusters of short spines, 2 pairs of short spines along anterior margin; dactyl short, length less than 0.5x propod. Peraeopods 5-7, merus longer than carpus, anterior margins spinose; propod 1.6x carpus, anterior margin with 7 paired spines; dactyl short, slightly curved, length 0.6x propod.

Epimeral plates, ventral margins with short setae; plates 1-2, posteroventral corner with small tooth; plate 3, posteroventral corner produced into a large tooth. Uropod 1, peduncle subequal to inner ramus, margins with short spines; outer ramus slightly < inner ramus. Uropod 2, peduncle length 0.75x inner ramus; outer ramus, length about 0.7x inner ramus, margins serially spinose. Uropod 3, peduncle short, length ~0.47x inner ramus, with 1 apicolateral spine; outer ramus short, length about 0.6x inner, with 4 ventrolateral spines and 4 dorsomedial spines.

Telson elongate linguiform, distally rounded, not exceeding peduncle, with 2 paired pennicilate setae at mid margin.

Male: unknown.

Etymology: From the Greek *akuminos* (pointed), with reference to the acutely projecting processes of antenna 1, peduncular segment 1.

Distributional Ecology: Known only from the Pribilof Islands; ecology unknown.

Remarks: As noted above, *Rhinopleustes acuminatus* differs markedly from most other genera of Pleusymtinae. However, it is similar to species of *Pleusymtes* subgroup 4 in form of coxal plates and bases of peraeopods 5-7 (see key, p. 66).

Budnikopleustes n. g.

Pleusymtes (part) Budnikova, 1995: 10.

Type species: *Pleusymtes vasinae* Budnikova,1995 (monotypy)

Diagnosis: Body middorsally with rounded carinations on peraeon segments 1-7 and pleon segments 1-3. Urosome segment 2 not occluded dorsally.

Head, rostrum not prominent. Eyes medium large, rounded. Antenna 1 peduncular segments 1 regular, length ~ segments 2 & 3 combined, segment 3 short; accessory flagellum minute, rounded. Antenna 2 slightly shorter than antenna 1, peduncular segments 4 & 5 subequal.

Upper lip, apical lobes asymmetrical. Lower lip, inner lobes vestigial, obliquely sloped. Mandible, left lacinia 7-dentate, right lacinia lacking; molar strong, with pavement-type grinding surface; ~8 blades on right spines row, 2 distal blades broadened; palp stout.

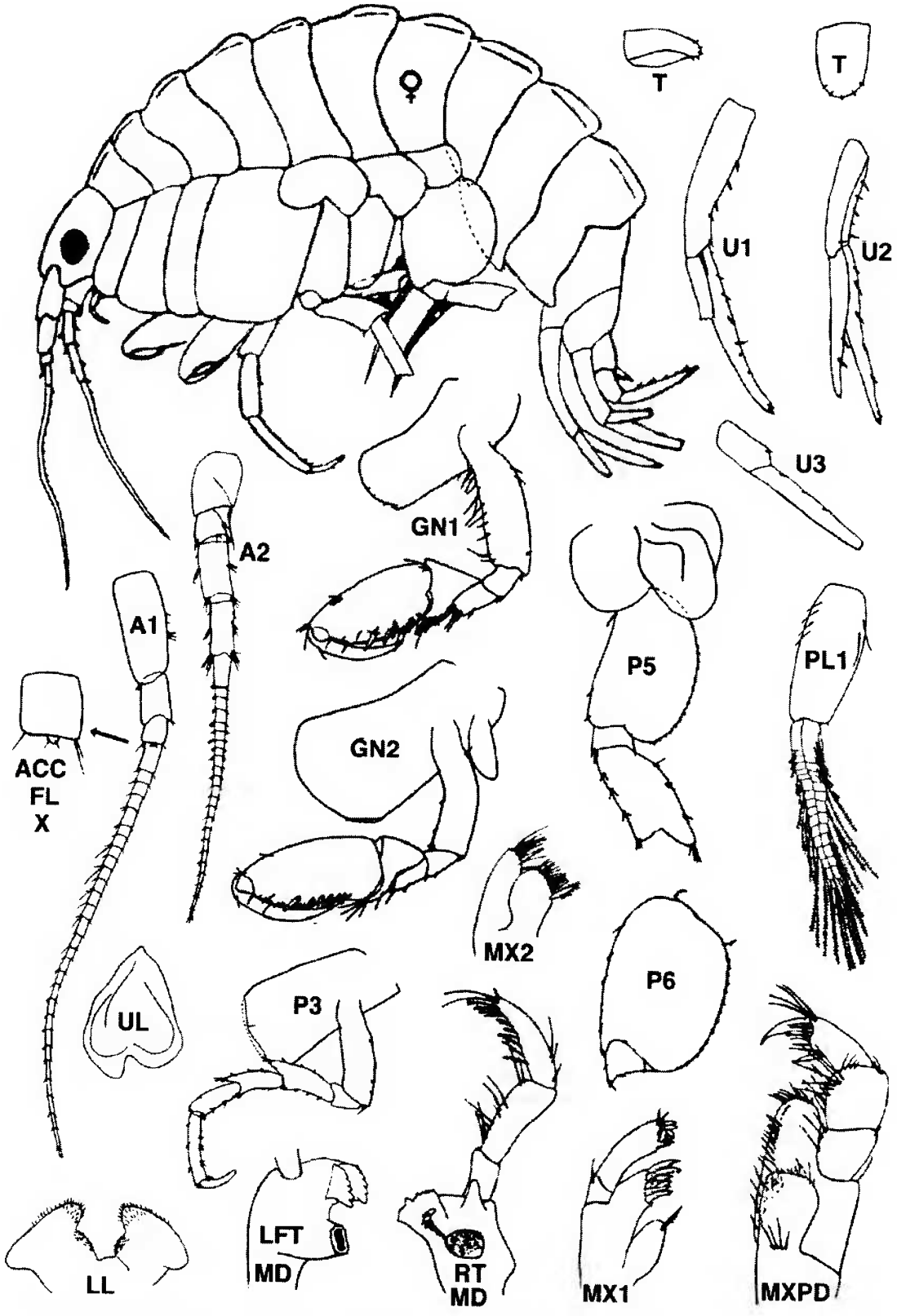

Fig. 16. ***Budnikopleustes vasinae*** (Budnikova). Female ov (8.2 mm). West Sakhalin I. (modified from Budnikova 1995)

Maxilla 1, inner plate with 1 apical seta; outer plate with 9 apical spine teeth; palp large, with 5-6 apical spines; proximal segment with outer marginal seta. Maxilla 2, inner plate broader than outer, strong inner marginal seta inserted close to apical setae. Maxilliped, inner plate broad, with ~4 apical button spines; outer plate medium with large basal segment; palp stout, segments 1 & 2 short, stout; segment 3 simple, longer than curved dactyl.

Coxal plates 2-4 very deep, increasing regularly beyond coxa 1 that is bent forwards distally; coxae 1-3 each with single small posterodistal tooth; coxae 5 & 6 normally posterolobate. Coxal gills medium, sac-like.

Gnathopods medium strong, subsimilar, gnathopod 2 slightly larger. Propod palmar margins oblique, spinose, with submedial triangular tooth, hind margin short; carpus short, posterior lobe narrow. Gnathopod 2, merus with posterodistal tooth.

Peraeopods 3-4 slender medium long; segment 5 shortest; dactyls not elongate. Peraeopods 5-7, basis broad, hind margin convex, posterodistal lobes rounded.

Epimeral plates 2 & 3, hind corners produced, acute. Pleopods normal, natatory. Uropod 1, peduncle with distolateral spine. Uropods 2 & 3, outer ramus shorter than inner ramus.

Telson linguiform, length 1.4x width, apical margin with small spines.

Etymology: The generic name honours Dr. L. L. Budnikova who is contributing to knowledge of marine biocenoses in the western Pacific region and who described the type species.

Remarks: The genus *Budnikopleustes* is placed within subfamily Pleusymtinae because of the following character states: accessory flagellum small but distinct; coxal plates large, deep; and mandibular molar with pavement-type grinding surface. Character states of maxilla 2, maxilliped palp, and gnathopods 1 & 2 conform best with subfamily Pleusymtinae.

Budnikopleustes shows no close relationship with other described genera of Pleusymtinae. Although the antennal peduncular segments are not distally processiferous, in balance of character states, *Budnikopleustes* appears least distant from *Rhinopleustes*. The spinose long-palmed propods of the gnathopods appear similar to those of *Pleusymtes quadrangularis* (Margulis). In view of basic dissimilarity of most other character states, this resemblance would seem convergent.

Budnikopleustes vasinae (Budnikova)
(Fig. 16)

Pleusymtes (?) *vasinae* Budnikova, 1995:10, figs. 1-3.

Remarks: With the characters of the genus. The original description was based on a single female specimen (8.2 mm) taken at a depth of 25 m off the West Sakhalin Islands, Aug. 16, 1977. The outer rami of uropods 1 and 3 had been damaged or lost. Although the description and figures are reasonably detailed, the coxal gills and brood plates were not fully described.

Heteropleustes n. g.

Type secies: ***Heteropleustes setosus*** n. sp. (p. 76).

Species: *Heteropleustes brachypalmus* (Ishimaru, 1984).

Diagnosis: Body smooth, not middorsally carinated. Urosome 2 dorsally narrowed but not occluded.

Head, rostrum small, not exceeding rounded anterior head lobe. Eyes large, rounded. Antenna 1, peduncular segment 1 somewhat enlarged, normal, lacking posterodistal acute process; peduncular segment 2 not reduced, segment 3 short; accessory flagellum minute, subtriangular. Antenna 2 distinctly shorter than antenna 1; peduncular segment 5 longer than 4, surfaces and margins setose.

Upper lip shallowly notched, slightly asymmetrical. Lower lip, inner lobes flat, broad; outer lobes widely separated. Mandible, left lacinia 6-7 dentate, right lacinia lacking; molar strong, with pavement-type grinding surface; left blades thickened, right blades slender; palp large. Maxilla 1, inner plate with single apical seta; outer plate with 9 tall apical spine teeth; palp stout, with 4 apical spines and subapical row of setae; proximal segment lacking marginal seta. Maxilla 2, inner plate short, broad, with 1-2 stout inner marginal setae inserted near apical setae. Maxilliped, inner plate short, broad, with 2 apical button spines; outer plate narrowing and rounded apically; palp strong, segment 2 longest; segment 3 simple, length subequal to nearly straight dactyl.

Coxal plates 1-4 medium deep, increasing regularly posteriorly; coxae 1-3 each with single small posterior cusp; coxa 1 rounded, not bent forwards distally. Coxae 5 & 6 distinctly posterolobate. Coxal gills medium, saclike, lacking on peraeopod 7.

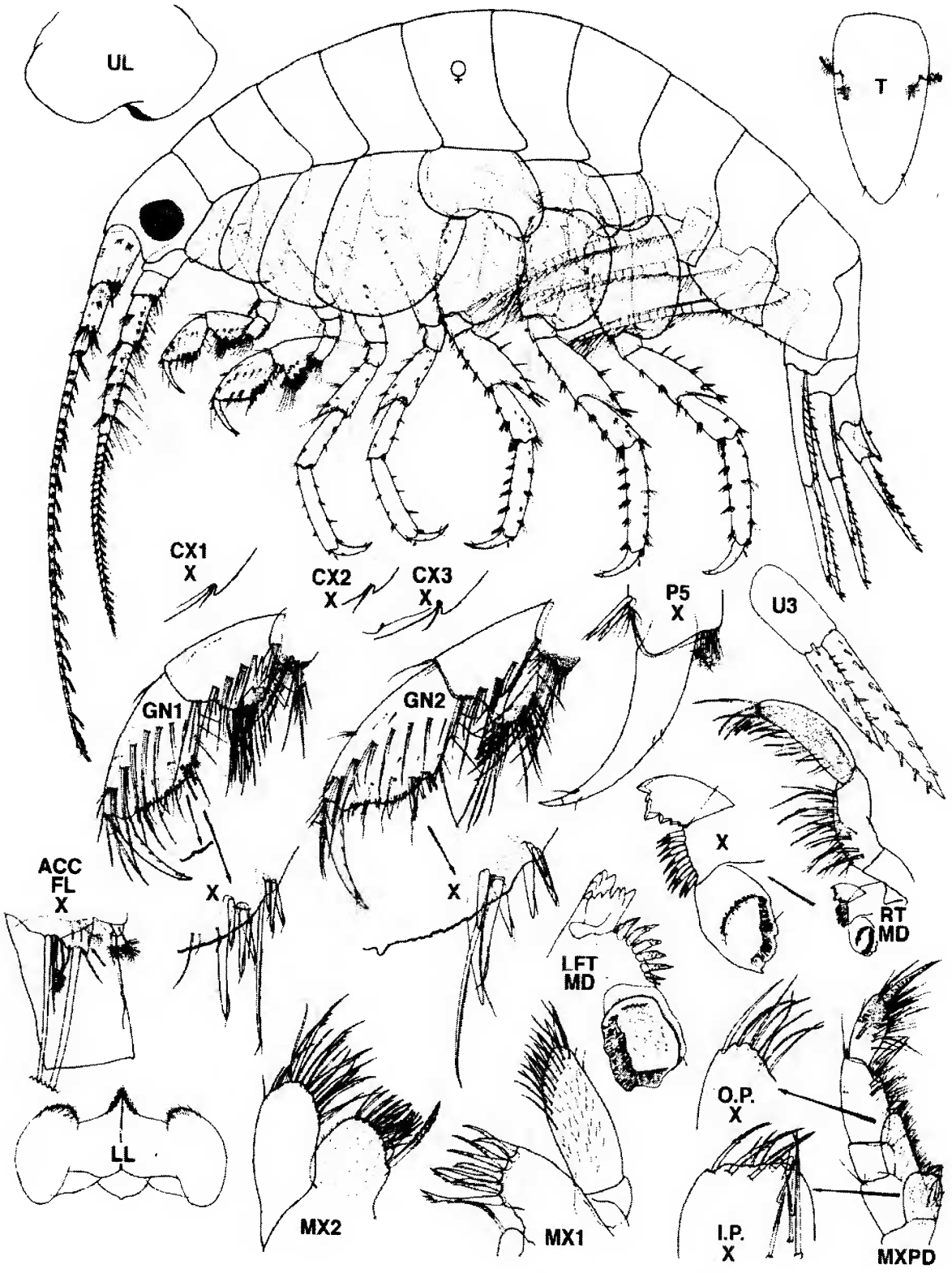

Fig. 17. ***Heteropleustes setosus*** n. sp. Female ov (6.0 mm); male 3.8 mm. ELB Stn B4, off Brady beach, Vancouver I., B. C.

Gnathopods 1 & 2 small to medium, subsimilar in form, sexually dimorphic; gnathopod 2 larger than 1. Palmar margin of propod convex, oblique, with 1-4 submedian teeth and 2-4 clusters of spines at posterodistal angle; hind margin weakly setose; inner face of propods with subparallel clusters of long setae; carpus elongate, inner face with row of setal clusters; posterior lobe broad, shallow, setose; merus with small posterodistal tooth.

Peraeopods 3-4 slender; segment 5 slightly shortest; dactyls short. Peraeopods 5-7 closely subsimilar; bases equally broad, posterior margins convex, posterodistal lobes shallow, rounded; dactyls short, slightly curved.

Epimeral plates 1-3, hind corners acute, not forming "hook". Pleopods slender, inner ramus longer than outer ramus. Pleopods 2 and 3 may be sexually dimorphic, wherein distal seta(e) of inner ramus are modified. Uropod 1, peduncle with distolateral spine. Uropods 2 & 3, outer ramus distinctly the shorter.

Telson elongate, narrowing distally to subacute apex; paired penicillate setae proximal to mid margin.

Etymology: Combining the Greek *heteros* (different) and the generic root *pleustes*, with reference to the sexually dimorphic gnathopods 1 & 2 and pleopods 2 & 3. Gender masculine.

Remarks: In balance of character states, *Heteropleustes* is close to *Pleusymtes*, but differs mainly in the sexually dimorphic gnathopods 1 & 2 (propods are more powerfully subchelate in male), and in the sexually dimorphic pleopods.

Heteropleustes setosus n. sp.
(Figs. 17, 18)

Material examined:
BRITISH COLUMBIA:
North Central coast, C. D. Levings Stns:
51B-029, Swanson Bay, 67 m., Apr. 4, 1973 - 2 im.;
Northern Vancouver I., ELB Stns, 1959:
V3, Nahwitti Bar, Hope I. (50°55'N, 128°02' W), "A.P. Knight" dredge 11-73 m, July 17 - 1 im.
Southern Vancouver I., ELB Stns, 1976:
B4, Off Brady Beach (48° 50.3'N, 125° 08.0'W), sand and algae, 8-10 m dredge, June 25 - 1 ♀ ov (6.0 mm.) **holotype** (slide mount), CMNC 2004-0134; Ibid., 1 ♂ (3.8 mm.) **allotype** (slide mount), CMNC 2004-0135; Ibid., ♂ (5.0 mm), 1 ♀ ov, 1 ♀ br. II, **paratypes**, CMNC 2004-0136; B28, Edward King I., LW intertidal (48° 50' N, 125° 12.5' W), July 10 - 1 ♀ ov (6.7 mm).
ELB Stns, 1977: B13, Trevor Channel, off Brady Beach (48° 49.6' N, 125°10.5' W), dredge 6-15 m., hard sand, stone, algae, May 25 - 1♀ (photo'd).
R. J. Anderson Stns., 1976: Bordelais I., from *Suberites* sp., June 25 - 2 ♀♀ br I & II; Bordelais I., north side, from *Myxilla incrustans*, June 25 - 2 ♀♀ ov (5.5 mm).

WASH-ORE: ELB Stns, 1966.
W61, Neskowin Beach, Tillamook Co. (45°05.5' N 123° 59' W). Record here is plausible but no firm data available.

Diagnosis: Female ov (6.0 mm). Body lacking dorsal carination. Rostrum short, apex acute, anterior head lobe rounded, anteroventral corner of the head short, subacute. Eye large, diameter about half width of head. Antenna 1 long, about 0.7x body length; peduncular segment 1 medium, length slightly < head; peduncular segments 1-3 with facial clusters of small spines; flagellum length about 3x peduncle length, ~35-segmented, posterodistally with aesthetases and short setae; accessory flagellum with one long, strong apical seta, and a short plumose seta. Antenna 2, posterior marginal setae of segment 5 longer than those of segment 4; flagellum ~ 25-segmented.

Upper lip shallow, nearly symmetrical. Lower lip, outer lobes relatively small, subovate. Mandible, incisor margins 6 -dentate; left lacinia mobilis 6-dentate; left accessory spine row with 6-8 thickened blades, right spine row with 10 slender blades; molar columnar, triturative surface large but not ridged; palp large; segment 2, length about twice segment 1, inner margin strongly setose; segment 3 slightly arched, subequal to segment 2, with single basally inserted A seta, inner margin with ~12 slender D setae, apex with 5-6 medium long E setae. Maxilla 1, inner plate very short and rounded; outer plate short, with 9 slender multi-cusped apical spine-teeth; palp, apex of segment 2 oblique, rounded; segment 1 short, lacking marginal setae. Maxilla 2, inner pllate shorter and broader than outer with short apical setae and spines. Maxilliped, inner plate, subquadrate, reaching base of palp, apex with 2 button spines and 3 strong pectinate setae, and 5 long inner marginal setae; outer plate, elongated, reaching about 0.3x length of palp segment 2, rounded apically, with 8-10 apical long setae, inner margin setose; palp segment 1, length about 0.3x segment 2, segment 3, length about 0.6x width; dactyl very slender, slightly curved.

Coxal plates 1-3 subrectangular, lower margins nearly straight; coxa 4 much the broadest, posterior margin smoothly convex distally, sharply excavate proximally. Coxal plates 5-6 posterolobate; coxa 7 rounded.

Gnathopod 1, bases slender, margins weakly setose; carpus long, about 0.8x propodus length, posterior lobe

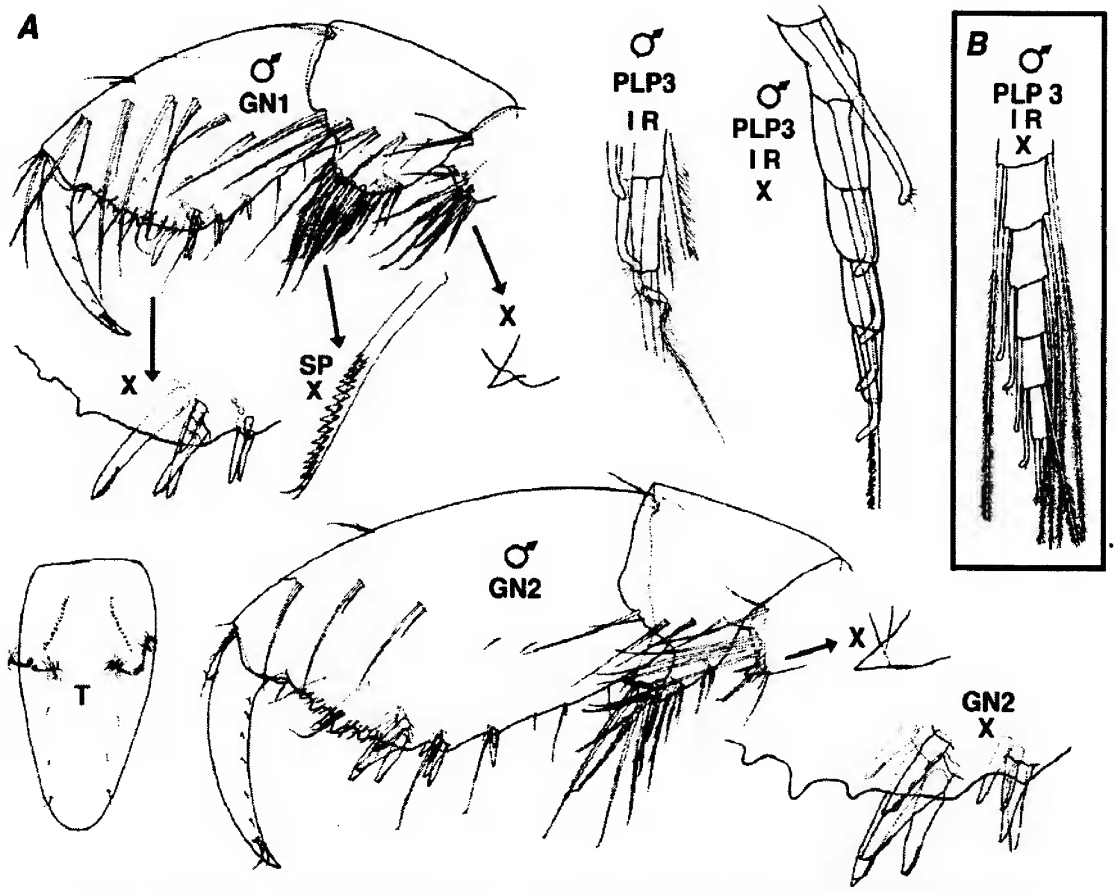

Fig. 18. ***Heteropleustes setosus*** n. g., n. sp. A. Male (5.0 mm); B. Male (3.8 mm) ELB Stn. B4, Off Brady Beach, Vancouver I., B. C.

short, broad; propod subtriangular, palm with small median tooth; slender dactyl closes on proximal groups of posterodistal palmar spines. Gnathopod 2 similar to 1; carpal lobe slightly larger and deeper, barely reaching posterior margin of propod.

Peraeopods 3-4, basis slender, length about 4x width, anterior and posterior margins with short setae; segments 4 anterodistally acutely produced; segment 6 longest, with 3 posterior marginal clusters of short spines; dactyls short, length about 0.4x propod. Peraeopods 5-7, bases regularly broadened and rounded behind, posterodistal lobes shallow; segments 4-6, anterior and posterior margins with 2-4 clusters of short spines.

Epimeral plates 1-3, ventral margins with short spines, hind corners acute, not produced. Pleopods slender, 2 largest, 3 smallest; inner ramus of pleopods 1 & 2 longer than outer ramus, terminal (apical) setae of both rami normal. Uropod 1, rami slender, subequal, margins with short spines, outer ramus slightly <inner ramus. Uropod 2, peduncle shorter than inner ramus; outer ramus about 0.6x inner ramus. Uropod 3, peduncle shorter than outer ramus that is 0.6x inner ramus; ramal margins serially with short spines.

Telson, with acutely rounded apex; length nearly twice width, with slightly proximal ventral keel.

Male (5.0 mm): Gnathopods 1 & 2 more strongly sub-chelate and palmar margins more steeply vertical than in female. Gnathopod 1, propod and carpus with med-ian facial subparallel rows of setal clusters; palmar margin with 2 median facial teeth and 3 groups of spines at posterior angle. Gnathopod 2, propod with 3 facial clusters of setae; palmar margin with 3 unequal median teeth, and 3 spine groups at posterodistal angle.

Pleopods 1 & 2 normal, inner ramus slightly the longer. Pleopod 3, inner ramus, inner marginal setae of the 4-5 distalmost segments (except terminal (apical) segment) modified as slender spines, spines successively shorter distally, each spine narrowing to bluntly rounded apex, and bent subapically almost at right angles to the main shaft.

Etymology: Derived from the Latin *setosus* (bristly), with reference to the setose antennae and inner face of gnathopodal propod and carpus . Gender masculine.

Distributional Ecology: Outer coast of British Columbia to central Oregon, associated with shallow-water sponges.

Remarks: The unusually reduced and setose form of the gnathopods may reflect its feeding style in commensal association with reef sponges.

Heteropleustes setosus (Fig. 18) is distinguished from H. *brachypalmus* (Fig. 19) by the following character states of the male: gnathopods 1 & 2, propods less strongly developed; peraeopods 5-7, posterior margins of bases evenly rounded; pleopod 3 sexually dimorphic, and telson more elongate and apically acute.

Heteropleustes brachypalmus (Ishimaru)
(Fig. 19)

Pleusymtes brachypalma Ishimaru,1985: 43, figs, 1-5; —Barnard & Karaman 1991: 652;—Ishimaru 1994: 55.

Material examined: Rausu, Hokkaido, Japan, among *Laminaria*, 3 m depth, S. Ishimaru coll., June 4, 1984 - 1 ♂ (4.7 mm) (slide mount), voucher specimen, CMNC 2004-0095.

Remarks: The gnathopods of *H. brachypalmus* are stronger and the palm more oblique, but with fewer groups of inner facial setae than in *H. setosus* (Fig. 18). Gnathopod 2 is generally similar to that of *H. setosus* in the presence of a small posterodistal meral tooth, and two or more small triangular teeth on the propodal palmar margin. The mouthparts of the two species are also remarkably similar. However, in *H. brachypalmus* coxa 1 is shallowly but distinctly anterodistally concave, the peraeopod bases are more sharply angular, and the telson is relatively short, the penicillate setae inserted mediomarginally. Also, the terminal pair of setae of the inner ramus of pleopod 2 are lined with two rows of short scales, rather than with ordinary fine setules of the terminal setae of the outer ramus. In view of the sexual dimorphism of setae of the inner margin of pleopod 3 in *H. setosus*, the modified pleopod setae of the male of *H. brachypalmus* may differ from those of the yet unknown counterpart female.

Anomalosymtes n. g.

Type species: ***Anomalosymtes coxalis*** n. sp. (original designation).

Diagnosis: Body smooth, lacking mid-dorsal carinations. Urosome 2 not occluded dorsally.

Rostrum medium strong, slightly exceeding anterior head lobe. Antenna 1, peduncular segment 1 enlarged, with strong anterodistal process overhanging segment 2; segments 2 & 3 short, combined length ~0.7x segment 1. Accessory flagellum small, 1-segmented. Antenna 2 shorter than 1, peduncular segment 5 longer than 4.

Upper lip shallowly notched apically, lobes slightly asymmetrical. Lower lip, inner lobes not developed. Mandible, left lacinia 8-dentate, right lacinia lacking but distal blade of spine row expanded; molar process strong, grinding surface with ridged margin; palp stout. Maxilla 1, inner plate with single apical seta; outer plate with 9 tall apical spine teeth; palp slender, proximal segment bare. Maxilla 2, inner plate little broadened, slightly shorter than outer plate, two inner marginal stout setae inserted adjacent to apical setae. Maxilliped, inner plate slender truncate apex with 3 apical button spines; outer plate normal; palp large, segment 2 longest; segment 3 broadest, subequal in length to slender dactyl.

Coxa 1 bent forwards distally, anterior margin shallowly concave. Coxal plates 2-4 abruptly much deeper, narrow. Coxae 1-3 with distinct posterior cusp and 2-3 smaller supernumerary cusps. Coxa 4 very deeply excavate posteroproximally. Coxae 5 -7 very deep, shallowly posterolobate. Coxal gills small, saclike, lacing on peraeopod 7. Brood plates medium large, subovate.

Gnathopods 1 & 2 medium strong, closely subsimilar in size and form; bases almost devoid of marginal setae; propodal palmar margins smoothly oblique and convex, lacking submedial tooth, with weak spine clusters at posterodistal angle; hind margin short; dactyl slender. Gnathopod 2, merus with small posterodistal tooth; carpus short, posterior lobe narrow, masking base of propod.

Peraeopods 3-7 slender, segment 5 slightly shorter than 4 & 6, dactyls medium long. Peraeopods 5-7, bases narrow, increasing in size posteriorly. Peraeopod 7, basis distinctly deeper, narrower, posterodistal lobe deep, hind margin nearly straight.

Epimeral plate 3, hind corner nearly squared. Pleopod rami short, not sexually dimorphic. Uropod 1, peduncle lacking distolateral stout spine. Uropods 2 & 3, outer ramus distinctly the shorter.

Telson elongate, subrectangular, proximomedially keeled, notched apically.

Etymology: Combining the Greek *anomalos* (irregular), and the generic root suffix *-symtes*, with reference to the unusual combination of character states of the genus within family Pleusymtinae. Gender feminine.

Remarks: Several character states of *Anomalosymtes* are more plesiomorphic than other genera within the Pleusymtinae. These include: accessory flagellum well developed; mandibular molar strong, with mar-

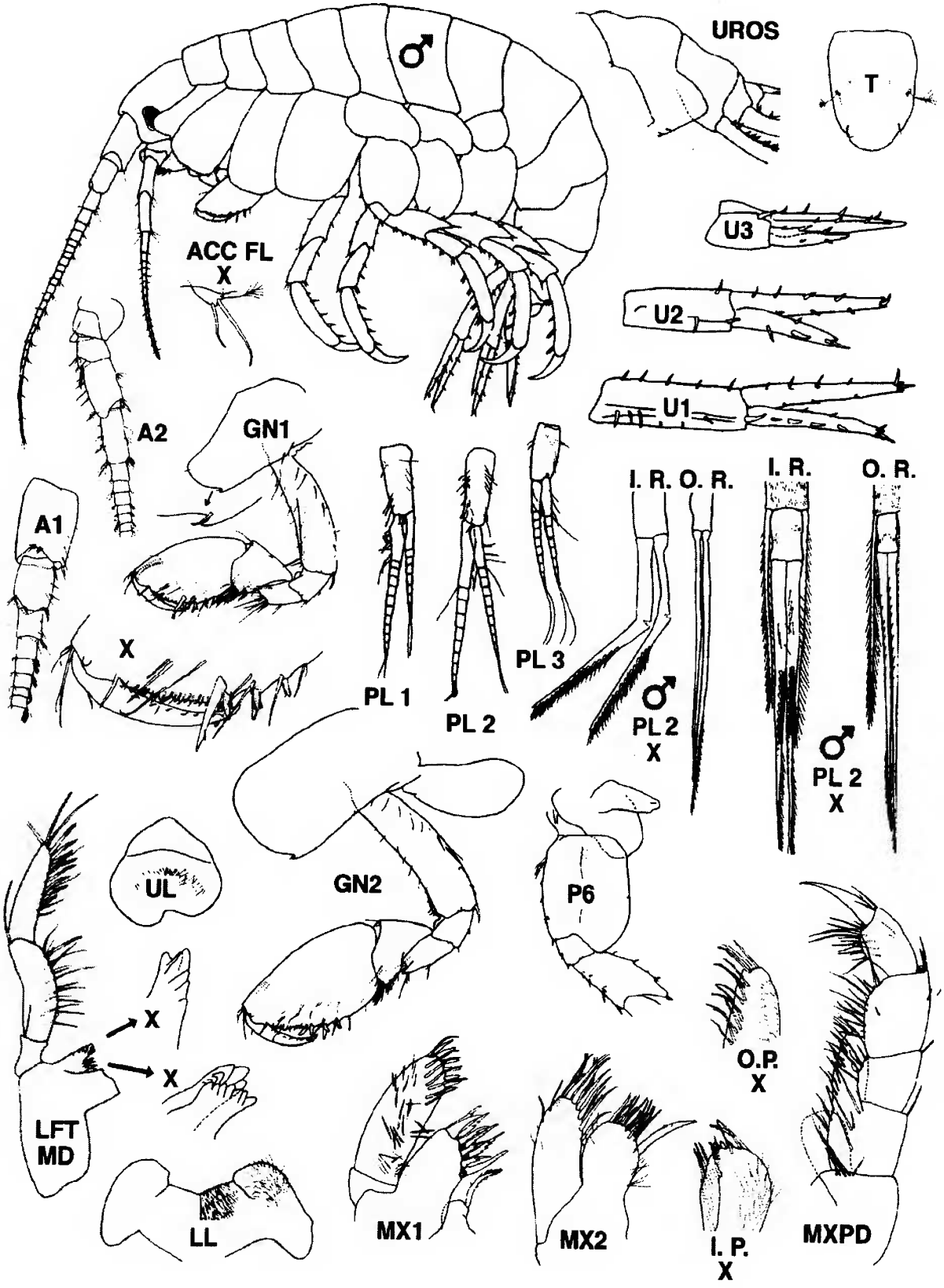

Fig. 19. *Heteropleustes brachypalmus* (Ishimaru, 1985). Male (5.4 mm). Hokkaido.

ginally ridged grinding surface, expanded lacinia-like right blade present; coxa 1distally bent forwards, and coxae 2-4 narrow and very deep. *Anomalosymtes* may therefore represent a connecting link between subfamilies Pleusymtinae and Mesopleustinae.

Anomalosymtes coxalis n. sp.
(Fig. 20)

Material Examined.
BRITISH COLUMBIA
North Central Coast, ELB Stns, 1964:
H30, Rennison I., north end (52° 51' N, 129° 21' W), 8-25 m. dredge, July 20 - 1 ♀ ov (3.0 mm) **holotype** (slide mount) CMNC 2004-0141; Ibid., 1♀ ov (3.4 mm) (slide mount) + 10 ♀♀ + 14 im, **paratypes**, CMNC 2004-0142.

Diagnosis: Female (3.0 mm). Body smooth. Rostrum extending about 0.5x peduncular segment 1 of antenna 1; anterior head lobe acutely subtriangular; inferior cephalic sinus deeply recessed; anteroventral process sharply acute. Eye medium, subovate. Antenna 1, length ~0.8x body; peduncular segment 1 strong, elongate, anterior margin with stout acute spine; peduncle 2, length ~2x peduncle 3, combined length ~0.7x segment 1; flagellum ~36-segmented, segments posterodistally with short aesthetascs; accessory flagellum small, triangular, with long apical seta. Antenna 2 shorter than 1; peduncular segment5 longer than 4.

Mandible,incisors and left lacinia irregularly 8 dentate; blades stout, distalmost blade of right mandible broad, appearing as lacinia; palp large, about twice length of body, with single strong basal A seta, 3-4 distal D setae, and 5-6 short apical E setae; segment 2 with long inner distal alpha setae. Maxilla 1, palp slender, with 5-6 apical spines and 4 subapical setae. Maxilla 2, inner plate little broadened, slightly shorter than outer plate, apical setae short. Maxilliped, inner plate tall, broadening distally, apex subtruncate, with 2 tall button spines and 4 slender spines; outer plate short, extending little beyond palp segment 1, with 2 apical spines; palp segment 2 with mediodistal shelf; segment 3 broadest distally; dactyl nearly straight.

Coxal plates 1-3 posterodistally with 4 distinct cusps; coxa 4 very deeply excavate posteroproximally; coxae 5-7 shallowly posterolobate; coxa 7 rounded below.

Gnathopod 1, basis, margins nearly smooth; carpus short, length about 0.4x propod, posterior lobe short, narrow, apically setose; propod elongate-subovate, palm elongate, gently convex shallowly oblique, lacking mid-palmar tooth; dactyl slender. Gnathopod 2 slightly larger than 1, meral tooth prominent; carpal lobe longer and narrower than in gnathopod 1; propod and dactyl very similar in form to gnathopod 1.

Peraeopods 3-4 slender, basis, length about 2.3x width, anterior margin nearly bare; merus anterodistally acutely produced; carpus and propods subequal, shorter than merus; propod with 2 pairs of short spines along posterior margin; dactyl slender, length about 0.5x propod. Peraeopods 5-7, bases heteropodous, relatively narrow, with deep posterodistal lobes; segments 4-6 slender; segment 4 with anterior marginal clusters of long spines; dactyls slender, medium.

Epimeral plates 1-3, ventral margins smooth, posteroventral corners squared or nearly so. Pleopods regular, not sexually dimorphic. Uropod 1, peduncle, slightly > outer ramus, margins with short spines, outer ramus slightly < inner ramus, margins serially spinose. Uropod 2, peduncle slightly < outer ramus, margins with 4 short spines, outer ramus about 0.6x inner ramus, margins serially spinose. Uropod 3, peduncle medium, slightly < outer ramus, with 1 apical dorsal spine; outer ramus, length about 0.6x inner, with 4 posterolateral spines and 4 posteromedial spines; inner ramus with 8-9 posteromedial spines.

Telson, length about 1.7x width, exceeding peduncle, apex subtruncate; penicillate setae inserted submarginally and slightly distad of mid point; ventral keel proximal.

Etymology: From the Latin *coxa* (hip), with reference to the very deep narrow coxal plates unique to this species.

Distributional Ecology: Northern British Columbia to Oregon, shallow subtidal to 25 m depth.

Remarks: *Anomalosymtes coxalis* is readily distinguished from all other species of Pleusymtinae by the coxal plates, which are very narrow and deep, the first three plates having strongly quadricuspate posterodistal corners; by the bases of peraeopods 5-7 which differ markedly in size and form, and by inner plate of maxilla 2, the two inner marginal setae of which are inserted distally, among the apical setae.

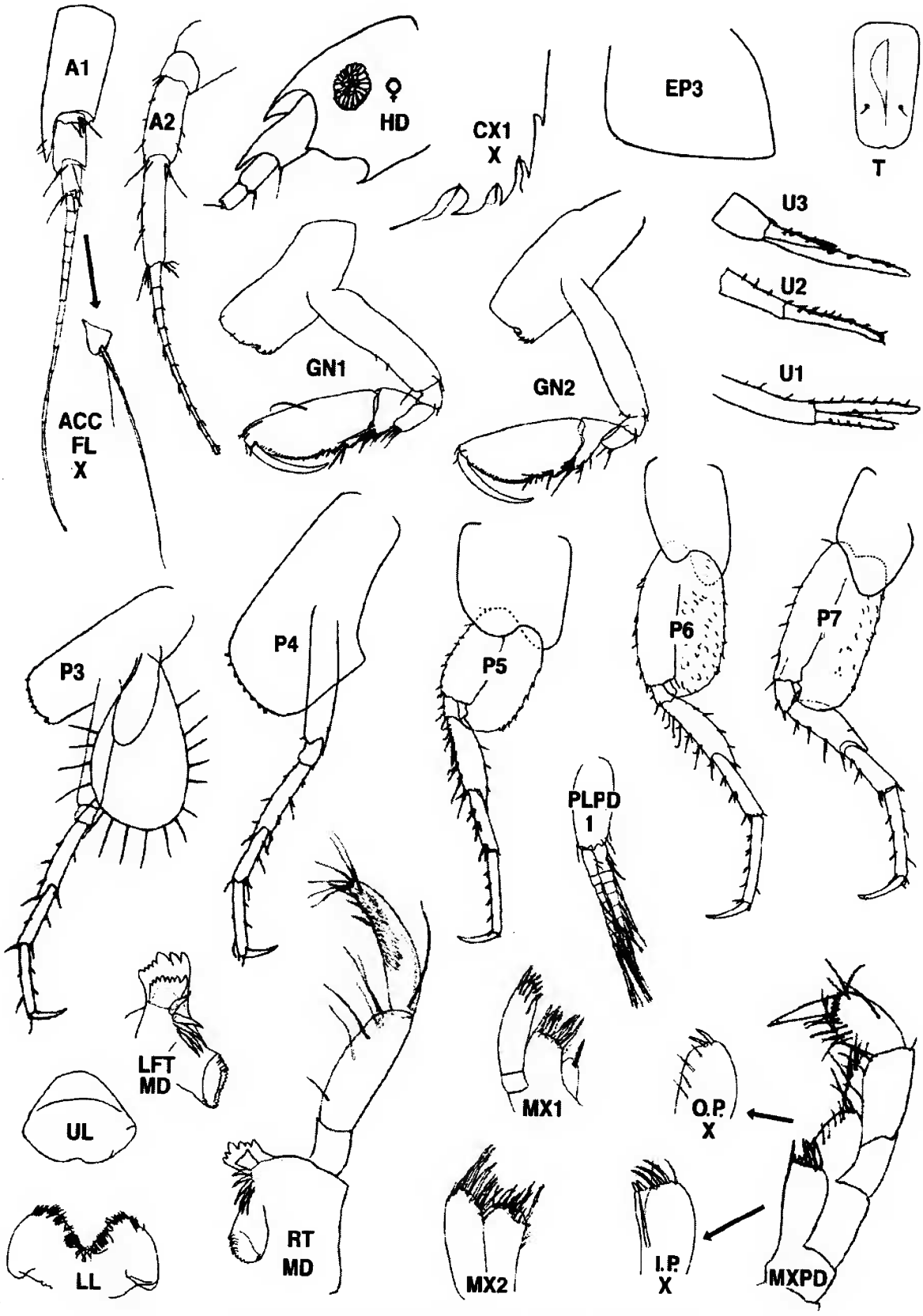

Fig. 20. ***Anomalosymtes coxalis*** n. g., n. sp. Female (3.0 mm).
ELB Stn H30, Rennison I., B. C.

Holopleustes n. g.

Type species: ***Holopleustes aequipes*** n. sp. (original designation).

Diagnosis: Body smooth, lacking dorsal carinations. Urosome 2 narrowed but not occluded dorsally. Rostrum medium strong, deep, exceeding blunt anterior head lobe. Eyes small, short reniform. Antenna 1, peduncular segment 1 thickened,with short thickened anterodistal process; peduncular segments 2 & 3 very short. Accessory flagellum evanescent. Antenna 2 shorter and more slender; peduncular segments 4 & 5 short.

Upper lip weakly notched and slightly asymmetrical. Lower lip, inner lobes weak, sloped. Mandible, left lacinia 11- dentate, right lacinia lacking; molar process weak, with small pavement-type grinding surface; blades 6-8 , slender; palp short, stout,with single strong basal "A"seta, 3 distal "D" setae and 3-4 apical medium length "E" seta. Maxilla 1, inner plate with single apical setae; outer plate with 9 slender apical spine teeth; palp very broad, weakly armed, proximal segment bare. Maxilla 2, inner plate broadened; inner marginal setae adjacent to apical setae. Maxilliped, inner plate short, not broadened, with 3 small apical button spines; outer plate medium large, apically rounded; palp relatively small, segments short, subequal; dactyl heavy, nearly straight.

Coxa 1 rounded below, very slightly anterodistally flexed. Coxal plates 2-4 sharply larger, wider, and deeper, increasing regularly posteriorly; coxae 1-3 with single minute posterodistal cusp. Coxa 5 aequilobate, 6 shallowly posterolobate. Coxal gills large, broadly saclike. Brood plates large, subovate.

Gnathopods weak, slightly unequal in size; palmar margins smoothly convex and oblique, lacking submedial tooth, with 2 clusters ofspines at posterodistal angle, hind margin nearly bare. Gnathopod 2, merus posterodistal tooth lacking; carpus medium, lobe shallow.

Peraeopods 3-7 relatively short and stout, segment 5 slightly shorter than 4. Peraeopods 5-7 closely subsimilar in size and form; bases generally broad, hind margins convex; dactyls strong.

Epimeral plate 3, hind corner square. Pleopods relatively small, short, not sexually dimorphic. Uropod 1, peduncle with very weak distolateral spine; outer ramus slightly the shorter. Uropods 2 & 3, outer ramus not greatly shorter than inner ramus.

Telson short, subrectangular, rounded apically; penicillate setae median, submarginal.

Etymology: Combining the Greek prefix *holos* (whole, entire) and the generic root *pleustes*, with reference to the overall pleustid features of this somewhat aberrant pleusymtid genus. Gender masculine.

Remarks: The genus *Holopleustes* is atypical of Pleusymtinae and shows no close relationship to other genera within the subfamily.

Holopleustes aequipes n. sp.
(Fig. 21)

Material Examined:
BRITISH COLUMBIA
Queen Charlotte Ids., ELB Stns,1957:
H14, Yakan Pt., Graham I. (54°04' N, 131°50' W), main reef, LW level, Aug. 25 - 1 ♂, 2 im.
S. Vancouver I., ELB Stns:
1970: P702, Long Beach, south end, July 6 - 1 ♀.
1977: B11b, Long Beach, s. end at Lodge, May 23 - 1 ♀ (photo'd); B19b, Brady Beach, LW- 1 ♀ (photo'd).
Anon., Victoria region, C. Low coll., Aug. 28, 1981 - 1 ♀ br II (3.7 mm), CMNC 1982-34.

WASH.-ORE.
ELB Stn W61, Neskowin Beach, Tillamook Co., Oregon (45° 05.5' N 123° 59.0' W), surf-exposed, medium sand, shelly sand,and volcanic bedrock; LW-HW. levels, August, 1966,- 1 ♀ ov (3.3 mm) **holotype** (slide mount) CMNC 2004-0130; Ibid., - 1 ♂ (3.0 mm) **allotype**, CMNC 2004 0131; Ibid., 1 ♀ ov (not dissected) **paratype**, CMNC 2004-0132.

Diagnosis: Female ovig. (3.3 mm). Rostrum short, about 0.3x peduncular segment 1 of antenna 1, apex rounded; anterior head lobe subquadrate, rounded apically, lateral cephalic lobe a deeply recessed sinus, anteroventral corner of the head acute. Eye small, subreniform. Antenna 1 short, about 0.33x body length; peduncular segment 1 short, length slightly > width; segments 2 and 3, length 0.6x peduncle 1; flagellum ~21-segmented, length about 3.4x peduncle, posterodistally with aesthetascs and short setae. Antenna 2 shorter than antenna 1, flagellum ~14 segmented.

Upper lip, apical notch narrow. Lower lip, outer lobes rounded, oblique, not widely spread apart. Mandible, incisor margins with 10 teeth; left lacinia mobilis 11-dentate, right lacinia a chisel-shaped outer blade; accessory spine rows with 8-9 slender blades; molar columnar, trituritive, surface lacking ridges; palp, segment 3 curved, inner margin with 3 strong pectinate D

here is one lot NOT marked Paratype of H. aequipes but probably should be, cat. CMNC 2 I female. That does bring the total specimens up to that in the MS.

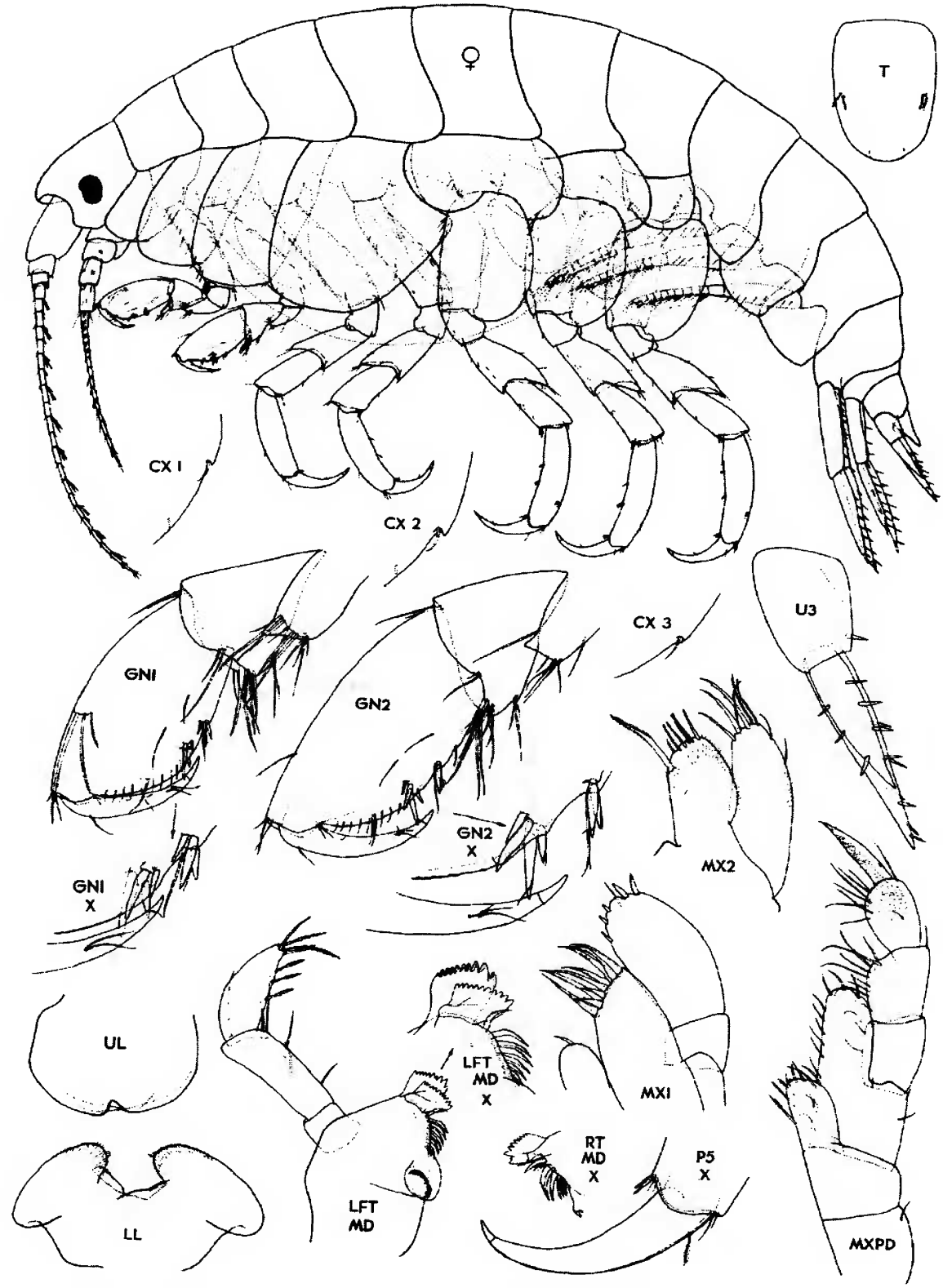

Fig. 21. ***Holopleustes aequipes*** n. g., n. sp. Female ov (3.3. mm). Neskowin Beach, Oregon.

setae, 4 short apical E setae, segment 1 about 0.4x segment 2. Maxilla 1, palp segment 2 broad, heavy, rounded apex with 5 unequal spines and single seta. Maxilla 2, inner plate short, broad, with single stout inner marginal seta near base of 4-5 short apical setae. outer plate narrow, with 5-6 apical setae. Maxilliped, inner plate short, with 2-3 apical button spines; outer plate medium large, apically rounded; palp segments 1-3 short, subequal in length, segment 2 broadest; dactyl stout, nearly straight, slightly longer than segment 3.

Coxal plates 1-3 subrectangular, rounded below, posteroventral cusps very small. Coxa 1 directed slightly forward; coxal plate 4 very broad, posterodistal margin oblique, nearly straight. Coxae 5-7 shallowly posterolobate; coxa 7 rounded. Coxal gills large, plate-like, slightly smaller on peraeopods 5 & 6.

Gnathopod 1, carpus medium, length about 0.6x propodus length, with short posterior lobe; propod subrectangular, palm gently convex, with 2 clusters of posterodistal spines, hind margin bare. Gnathopod 2, carpal lobe slightly larger than 1; propodus, palm smooththly convex, oblique, lightly setose.

Peraeopod 3-4, basis length about 4.3x width, anterior and posterior margins with short setae; merus acutely produced distally, subequal in length to carpus; shorter than propod, posterior margins nearly bare; dactyl large, curved. Peraeopods 5-7, closely homopodous in form and size; bases medium broad, posterior margins shallowly convex, posterodistal lobes medium deep; segments 4-6 medium stout, anterior margins weakly armed; segments 4 & 5 distinctly shorter than 6; dactyls large, curved.

Epimeral plates 1-3, ventral margins nearly bare; posterodistal corners squared or nearly so. Pleopods normal, relatively short, not sexually dimorphic. Uropod 1, peduncle slightly < outer ramus, margins with short spines, outer ramus slightly < inner ramus, margins serially spinose. Uropod 2, peduncle slightly < outer ramus, margins with short spines, outer ramus slightly < inner ramus, margins serially spinose. Uropod 3, peduncle long, about 0.6x outer ramus, with 2 apical dorsal spines; outer ramus, length about 0.7x inner, with 5 anterolateral spines and 5 posteromedial spines; inner ramus with 9 posteromedial spines.

Telson medium long, exceeding peduncle, distally rounded; ventral keel slightly proximal; paired penicillate setae inserted about mid point submarginally.

Etymology: Combing the Latin *aequus* (equal, similar), and *pes* (foot), with reference to peraeopods 5-7 that are subsimilar in size and form.

Distributional Ecology: Queen Charlotte Islands to Oregon; open coast, sand and algae, LW to shallow subtidal depths.

Pleustomesus Gurjanova

Pleustomesus Gurjanova, 1972: 169;—Barnard & Karaman 1991: 651.

Type species: *Paramphithoe media* Goes, 1866.

Species: *Pleustomesus japonicoides* Gurjanova,1972: 170, figs. 26, 27; ?*Pleustomesus palmata* Margulis,1963: 172, figs. 6, 7.

Diagnosis: Body smooth or slightly "humped" on pleon. Urosome 2 dorsally narrowing. Rostrum strong, greatly exceeding acute anterior head lobe. Antenna 1, peduncular segment 1 elongate, posterodistal lobe weak or lacking; segments 2 & 3 short; accessory flagellum minute, flat.

Upper lip asymmetrically bilobate. Lower lip, inner lobes medium, angled. Mandible, molar process large, cylindrical, with "pavement" or "cobbled" grinding surface; left lacinia 7-dentate; blades 6-8, thick, spine-like; palp relatively short. Maxilla 1, inner plate with single apical seta; outer plate with 9 apical spines; palp relatively broad, with 7-8 apical spines; proximal segment with distal seta. Maxilliped, inner plate with 4 apical "button" spines; outer plate regular, tall; palp segment 3 regular, equal to segment 2; dactyl slender, curved.

Coxal plate 1 short, directed forwards anterodistally. Coxae 2-4 abruptly deeper and very broad. Coxae 1-3 with single medium to large posterodistal cusp. Coxae 5 & 6 deeply posterolobate. Coxal gills medium large.

Gnathopods 1 & 2 similar in form, 2 larger than 1; merus with small posterodistal tooth; carpus medium to elongate; propod, palmar margin lacking submedian tooth, posterodistal angle with clusters of stout spines.

Peraeopods 5-7 subequal in length, bases increasingly broad posteriorly, hind margins convex; dactyls medium long, slender.

Epimeral plates 2- 3, hind corners produced, acute. Pleopods normal, strong. Uropod 1, peduncle with short distolateral spine; rami subequal. Uropod 2, outer ramus a little shorter than inner ramus. Uropod 3, outer ramus > 2/3 inner ramus. Telson longer than broad, flat, apical margin rounded, penicillate setae lateromedial; ventral keel median.

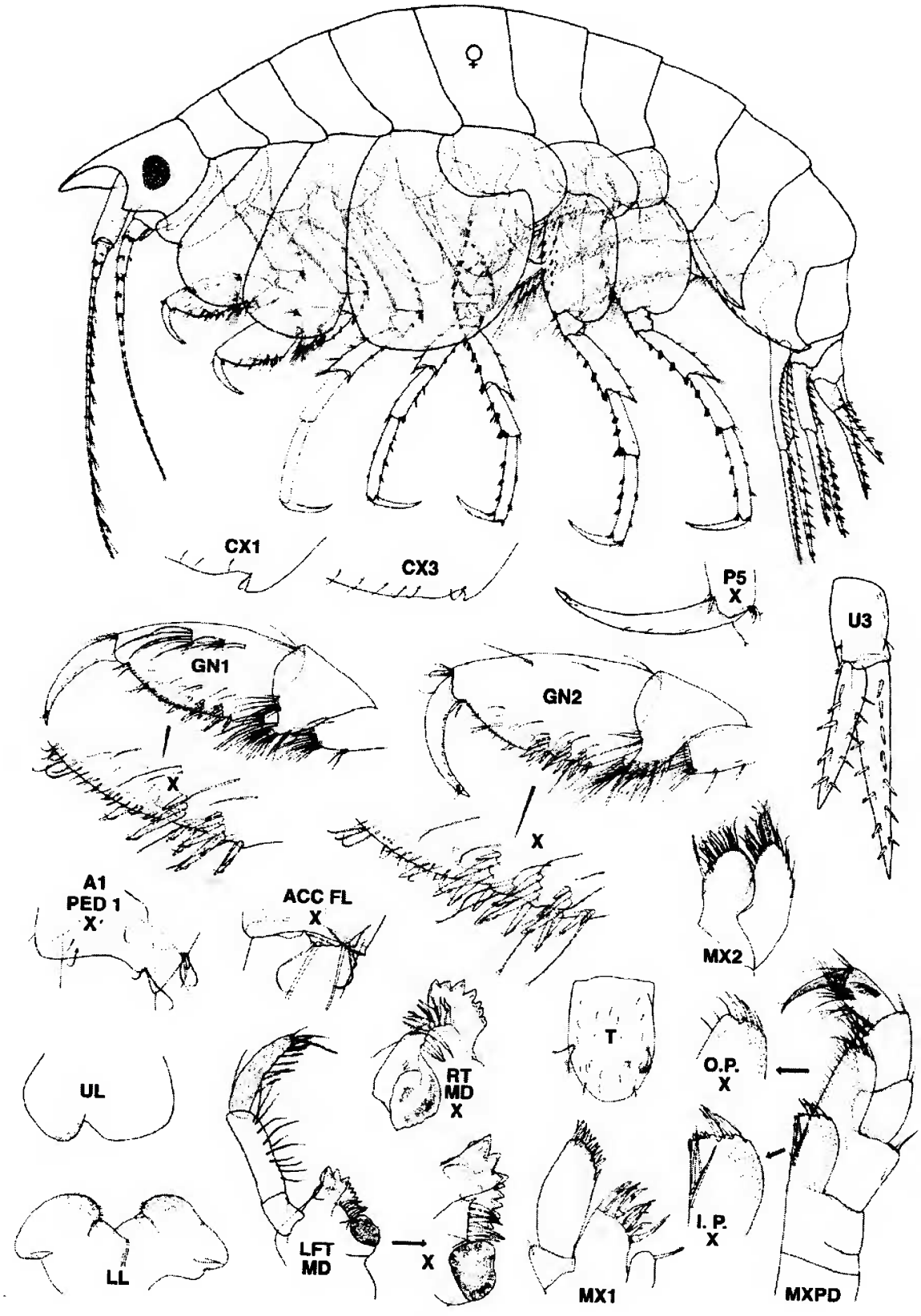

Fig. 22. *Pleustomesus medius* (Goes, 1866). Female br. 1(7.0 mm.), Creswell Bay, NWT.

Pleustomesus medius (Goes, 1866)
(fig. 22)

Paramphithoe media Goes, 1966: 523, pl. 38, fig. 13.
Pleustes medius Stebbing 1906: 311;—Shoemaker 1930: 307, fig. 38;—Stephensen 1938: 250, fig. 27;—Gurjanova 1951: 639, fig. 436;—Dunbar 1954: 750, fig. 21;—Shoemaker 1955: 42.
Pleustomesus medius Gurjanova 1972: 169, figs. 24, 25;—Barnard & Karaman 1991: 651;—Brunel et al. 1998: 201.

Material examined:
Creswell Bay, Northwest Territories, Canadian Arctic (72°46'N, 94°17' W), clay, mud, 59-62 m, Arct. Biol. Sta coll., Aug. 11, 1962 - 1 ♀ br. 1 (7.0 mm) (slide mount), CMNC 2004-0421.

Diagnosis: Female br. I (7.0 mm.). Anterior head lobe acutely produced. Rostrum, apex acute, length subequal to peduncular segment 1 of antenna 1; lateral cephalic lobe moderately recessed, anteroventral process acute. Eye lateral, medium, broadly ovate. Antenna 1 short, reaching about 0.33x body length; peduncular segment 1 large, posterodstal process short, acute; peduncular segment 3 shorter than 2, combined lengths about 1/2 segment 1; flagellum ~29-segmented, posterodistally with aesthetascs and short setae; accessory flagellum minute, subtriangular, with apical seta. Antenna 2, peduncular segments 4 & 5 subequal, weakly setose.

Upper lip, apical notch sharply incised. Lower lip, outer lobes irregularly rounded, not widely separated, inner lobes small, obliquely sloped. Mandible, incisor margins with 6-7 uneven teeth; left lacinia 6-7-dentate, right lacinia absent; right spine row with 8 slender blades, distal pair broader and chisel-shaped; molar columnar, triturative surface pavement-like, lacking ridges; palp segment 3, inner margin lined with 6-7 medium pectinate D setae, apex with 3-4 medium E setae; segment 2, inner margin with medium long alpha setae; segment 1 about 0.4x segment 2. Maxilla 1, apical spine teeth of outer plate slender, multicusped; palp stout, apex rounded, with 8-10 short spines and 5-6 short setae; segment 1 with 1 short distolateral seta. Maxilla 2, inner plate short, broad, stout inner marginal seta separated from shorter setae of oblique apex; outer plate narrow, apex sharply rounded, setose. Maxilliped, inner plate short, broad, with 4-5 button spines and 4 strong setae along truncate apex, and 4 strong inner marginal setae; outer plate elongate, subrectangular, reaching about 0.5x length of palp segment 2; palp segments 1-3 relatively short, segment 3 longest and broadest; dactyl slender, curved, slightly longer than segment 3.

Coxal plate short, narrow, anterodistally deflexed; coxae 2-3 deeply subrectangular, lower margins rounded, posterodistal cusps small; coxa 4 very broad, deeply excavate proximoposteriorly, smoothly rounded posterodistally; coxal plates 5-7 broadly posterolobate. Coxal gills medium large, saclike.

Gnathopod 1, carpus short, length about half propod, posterior lobe short, narrow, setose; propod subovate, palm shalowly oblique, setose; posterior margin short, bare. Gnathopod 2, meral posterodistal process very short; carpal lobe slightly longer and more setose than in gnathopod 1; propod similar to but larger than in gnathopod 1, posterodistal palmar angle with 4 clusters of 2-5 stout spines.

Peraeopods 3-4 slender, basis length about 4.3x width, anterior and posterior margins with short setae; merus with short, acute, anterodistal process, margins with short spines; carpus and merus subequal in length, shorter than propod, posterior margin with 3-4 short spines; dactyls slender, length about 0.5x propod. Peraeopods 5-7, bases unlike, that of peraeopod 5 narrow, hind margin nearly straight, that of peraeopod 7 broadly rounded behind; all with medium deep posterodistal lobes; segments 4-6 slender; dactyls slender.

Epimeral plates 1-3, ventral margins with short spines; epimeron 1, posteroventral corner subacute, plates 2 & 3 acute, produced. Pleopods well developed, not sexually dimorphic. Uropod 1, peduncle slightly < outer ramus, margins with short spines, outer ramus slightly < inner ramus, margins serially spinose; Uropod 2, peduncle slightly < outer ramus, margins with short spines, outer ramus slightly < inner ramus, margins serially spinose. Uropod 3, peduncle long, about 0.6x outer ramus, with 2 apical dorsal spine, outer ramus length about 0.7x inner, with 5 anterolateral spines and 5 posteromedial spines; inner ramus with 13 posteromedial spines.

Telson, long, distally rounded, length about 1.5x width, exceeding peduncle, with ventral keel; paired plumose penicillate setae marginally inserted about mid-point.

Distributional Ecology: Circumarctic and subarctic south in the North Pacific to the Sea of Okhotsk and southeastern Alaska; shallow subtidal and shelf.

Remarks: The species is a strongly rostrate distinctive member of subfamily Pleustinae, with closest similarity to ***Kamptopleustes*** n. g. and *Pleusymtes* sens. lat.

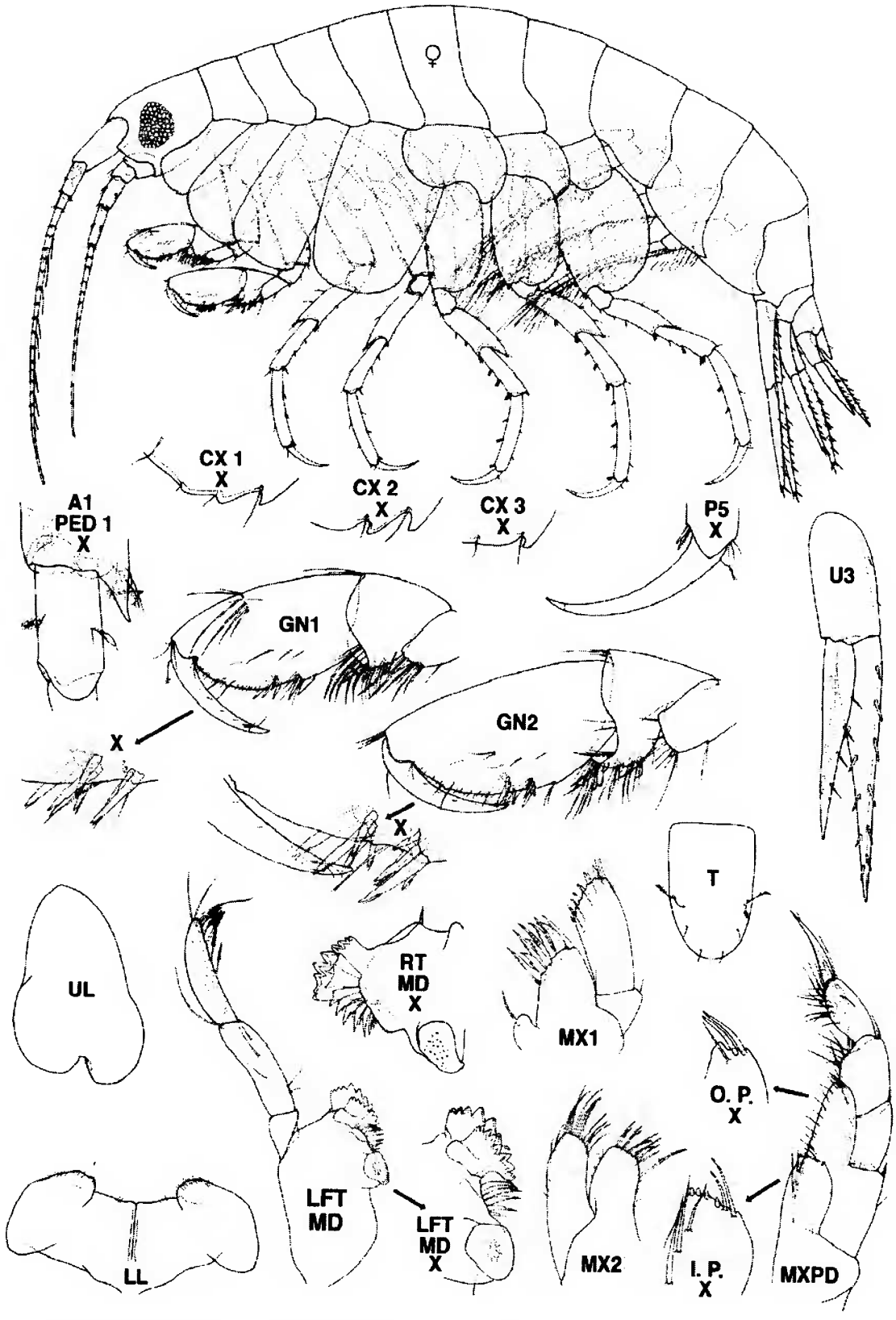

Fig. 23. ***Kamptopleustes*** *coquillus* (Barnard). Female (3.5 mm) Indian Arm, South Channel, B. C.

Pleustomesus japonicoides Gurjanova

Pleustomesus japonicoides Gurjanova, 1972: 170, fig. 26, 27;—Barnard & Karaman 1991: 651.

Remarks: The species is similar to *P. medius* in its strong rostrum, but differs in the elongate carpus and propod of its gnathopods. Known only from the northern Sea of Japan and Sea of Okhotsk.

Kamptopleustes n.g.

Pleusymtes (part) J. L. Barnard 1971.

Type species: *Pleusymtes coquilla* Barnard, 1971.

Species: ***Kamptopleustes spinosus*** n. sp.; *K. kamui* Ishimaru, 1985.

Diagnosis: Body dorsally smooth. Urosome 2 narrow but not dorsally occluded. Head rostrum short, not exceeding anterior head lobe. Antenna 1, peduncular segment 1 large, with posterodistal process; segments 2 - 3 medium; accessory flagellum minute, flat. Antenna 2, peduncular segments with median marginal setal clusters.

Upper lip strongly asymmetrical. Lower lip, inner lobes flat, broad. Mandibular left lacinia 8-9 dentate; molar reduced, with "pavement"-type grinding surface; blades 6-8, distalmost blades on right side with expanded chisel-like tip; palp medium. Maxilla 1, inner plate with single apical seta; palp broad, with 8-10 apical spines, segment 1 with outer marginal seta. Maxilla 2, inner plate broadened, inner marginal stout seta slightly separated from apical setae. Maxilliped, inner plate apically subtruncate, with 4 "button" spines; outer plate narrowing, with mediodistal tooth; palp segments subequal; dactyl slender, curved.

Coxal plate 1 short, distinctly directed forwards anterodistally. Coxae 2-4 abruptly larger, deeper than broad. Coxae 1-3 with 1-4 small to medium posterodistal cusps. Coxae 5 & 6 medium deep posterolobate.

Gnathopods small to medium, subsimilar in form; merus with minute posterodistal tooth; carpus short to medium; propodal palmar margins lacking spines, except at posterodistal angle, submedian tooth vestigial

Peraeopods 5-7 subsimilar in size; bases increasingly broad, posterodistal lobes shallow, posterior margins nearly straight; dactyls medium slender.

Epimeral plates 2 & 3, hind corner produced, acuminate. Uropod 1, peduncle with distolateral spine; rami sub-equal. Uropod 2, outer ramus slightly to distinctly shorter than inner ramus. Uropod 3, length of outer ramus about 0.76x inner ramus, apex lacking spine(s).

Telson linguiform, longer than broad, apex rounded; submarginal penicillate setae slightly distad of midpoint. Coxal gills, small to medium, sac-like. Brood plates very large.

Etymology: Combining the geographic term *kampto* (Kamchatka peninsula),and the generic root *pleustes,* with reference to the North Pacific distribution of component species. Gender masculine.

Remarks: *Kamptopleustes* is similar to *Pleustomesus* but differs in its relatively small coxal plates, and lack of a pronounced rostrum. The genus is linked to *Pleustomesus* by *P. kamui* which evinces character states diagnostic of both genera.

Kamptopleustes coquillus (Barnard)
(Fig. 23)

Pleusymtes coquilla Barnard, 1971: 74, figs. 47, 48;—Karaman & Barnard 1979: 114;—Barnard & Karaman 1991: 654.

Material examined:
BRITSH COLUMBIA ,
South Central coast, ELB Stns:
E5, Indian Arm, South Channel (49°18.8' N, 122° 56.3' W), mud and coarse sand, naturalist dredge, 60 m, Nov. 4, 1977 - 1 ♀ (3.5 mm) (slide mount) CMNC 2004-0138; Ibid., 1 ♂ 1 ♀ ov, 2 ♀♀ (photo'd); P5, off Pt. Grey, 80 m, Nov. 2 - 2 im; V2, off Spanish Banks, Burrard Inlet, 3-8 m dredge, July 4, 1978 - 1 ♀ ov. (slide mount).
C. Levings Stn B1, Burrard Inlet, 51 m, mud, Sept. 1, 1977 - 1 ♀ ov (3.3 mm) (slide mount), CMN Acc. No. 1977-328.

Diagnosis: Female ov (3.5 mm). Head: rostrum short, about 0.2x peduncular segment 1 of antenna 1, apex acute; anterior head lobe subtriangular; anteroventral sinus small, anterior process short. Eye large, broadly reniform. Antenna 1 lmedium, about 0.5x body length, peduncular segment 1, anterior margin with acute posterodistal setose process, length about 1.5x peduncular segment 2; segment 2 about 2x segment 3, combined lengths less than segment 1; flagellum ~22-segmented, posterodistally with aesthetascs. Antenna 2 slightly shorter than antenna 1; peduncular segment 5 longer than 4, margins nearly bare; flagellum very slender, ~14-segmented.

Upper lip, apical notch sharply and deeply incised. Lower lip, outer lobes subovate, oblique apart, inner

lobes thick, flat. Mandible, incisor margins with 7-8 irregular teeth; left lacinia 8-9 dentate; right spine row with 9 slender blades, distalmost pair with broad chisel-like apex; molar columnar, triturative, with pavement like surface, lacking ridges; palp segment 3 with basal A seta, inner margin with 4-5 strong pectinate D setae, apex with 3 medium E setae; segment 2, inner margin with only 5 short setae; segment 1, length about 0.33x segment 2. Maxilla 1, inner plate very short; outer plate, apical spine-teeth slender, multi-cusped; palp distally broadening, rounded apically, with 8 apical spines and 5 submarginal setae. Maxilla 2, inner plate short, little broadened, subtruncate, inner marginal seta near apical setae. Maxilliped, inner plate short, medially broadest, subtruncate apex with 4 button spines and 2 long setae, inner margin with 3 long setae; outer plate elongated, apex narrowing,with short median tooth and 3 slender spines, inner margin sparsely setose; palp segment 2 largest, with sloping mediodistal shelf; segment 3 narrower, length about 0.66x width, inner margin setose; dactyl slender, curved, slightly longer than segment 3.

Coxal plate 1 relatively short, narrow, slightly bent anterodistally; coxae 2-3 deeply subrectangular, 1-2 cuspate posteroventrally; coxa plate 4 very deep, little broadened, hind margin nearly straight; coxal plates 5-7 shallowly posterolobate; coxa 7 subquadrate. Coxal gills relatively short, narrow, that of peraeopod 6 sublinear.

Gnathopod 1, carpus medium, length about 0.5x propod, posterior lobe short, broad, richly setose; propod subrectangular, broadest medially, palm smoothly oblique and convex, mid-palmar tooth small, posterodistal angle with 2 groups of spines, posterior margin with single distal seta. Gnathopod 2 generally similar, larger; merus with short posterodistal tooth; setose carpal lobe deeper than in gnathopod 1 and produced forwards along proximal posterior margin of propod; propod similar in form to gnathopod 1 but lacking anteromedial facial cluster of strong setae; dactyl simple, strong, curved, tip closing on distal group of spines at palmar angle.

Peraeopods 3-4, basis, length about 4x width, anterior and posterior margins with short setae; merus anterodistally produced, margins with short setae; carpus slightly longer than merus, margins with short setae; propod slightly curved, margins with 2 pairs of short spines; dactyl slender, length about 0.66x propod. Peraeopods 5-7, bases unequal in form; basis of peraopod 5 narrow, of peraeopod 7 broad, all with medium deep posterodistal lobes; distal segments slender, weakly armed; dactyls medium long.

Epimeral plates 1-3, ventral margins smooth; posteroventral corners of plates 2 & 3 acute, produced. Pleopods normal, not sexually dimorphic. Uropod 1, peduncle with laterodistal spine, slightly < outer ramus, margins with short spines; outer ramus slightly < inner ramus, margins serially spinose. Uropod 2, peduncle about 0.7x outer ramus, margins with 2 short spines, outer ramus about 0.6x inner ramus, margins serially spinose. Uropod 3, peduncle short, about 0 4x outer ramus, outer ramus length about 0.75x inner, with 4 anterolateral spines and 4 posteromedial spines; inner ramus with 10-11 posteromedial spines.

Telson medium, linguiform, length about 1.5x width, equal to peduncle, with ventral keel; apex rounded; plumose penicillate setae inserted submarginally and slightly distad of mid point.

Distributional Ecology: From southern British Columbia to Oregon, subtidally to medium depths, on mud and sandy mud.

Remarks: The present material from Burrard Inlet compares closely with the type material of Barnard (loc. cit.) from deeper waters off Oregon.

Kamptopleustes spinosus n. sp.
(Fig. 24)

Material examined:
ALASKA:
Bering Sea, P. Slattery Stns:
1983: St. Matthew I., 20 m, clamshell scavenging, June 27 - 1 ♀ ov (slide mount); Punnuk I., 5 m, gravel, July 6 - 2♂♂, 1 ♀, 1 im; St. Lawrence I., June - 8 ♂♂, 3 ♀♀.
1984: Diomede I., Cape Hope, 2-5 m dredge, July 15 - 2 im; Ibid., 10-12 m scoop, ripple sand, July 18 - 1 ♀ ov, CMN collns.
Southeastern Alaska, ELB Stns:
1961: A83, Cordova Bay, Prince William Sound (60° 40' N, 145° 36' W), June 30 - 1 ♀ ov.
1980: S18F1, Kruzof I. off Kamenoi Pt. beach (57°08' N, 135°34' W), 2-34 m dredge, Aug. 2 - 2 ♀♀ ov (photo'd); S18F2, off Kruzoff I., 6 m dredge - 1 ♀, (photo'd) + 2 im; S18F3, Kruzof I. off Kamenoi Pt., 9 m dredge - 11 ♀♀ ov (to 7 mm) (slide mount) + 7 im; Ibid., 6 m. dredge - 1♀ ov. (CMNC collections).

BRITISH COLUMBIA:
North Central Coast, ELB Stns, 1964: H7, McCauley I., SW end (53° 42' N, 130° 24' W), July 11 - 17 im.
Southern Vancouver I., ELB Stns:
1976: B1 Bamfield Marine Lab (48° 50' N, 125° 08' W, at main float, June 24 - 1 im; B17, off Bordelais I., Trevor Channel (48°47.8' N, 125°13.6' W), July 5 - 1 ♂ (slide

mount), 1 im.
1977: B3, off Hammond Beach, Departure Bay (49° 12' N, 123° 56' W), 15-30 m nat. dredge, May 14 - 2 ♀♀ (photo'd); B17, off Cape Beale, mouth of Trevor channel (48°47.5' N, 125° 14' W), 60-65 m, mud, tube worms, May 30 - 2 ♀♀; B18, mouth of Trevor Channel (48° 48.0' N, 125° 13.5' W), sand and fine shell, naturalist dredge, 35-40 m, May 30 - 1 ♀ ov (6.5 mm) **holotype** (slide mount), CMNC 2004-0122; Ibid., - 1 ♂ (4.1 mm) **allotype** (slide mount), CMNC 2004-0123; 10♀♀ ov (1 dissected), 7♀♀ br. I, 3♂♂ (**paratypes**), CMNC 2004-0124.

South Central Coast:
C. Levings Sta, Vancouver Harbour, trawl No. 1, June 17, 1976 -1 ♀, CMN collns.
ELB Stns, 1976: EB7, English Bay, June 16 - 1 ♀ ov.
Burrard Inlet, ELB Stns,
1977: E1, Bekarra ? Bay, Indian Arm, 3-4 m. nat. dredge, Nov. 4 - 1 im; E5, Indian Arm, south channel, 60 m. nat. dredge, Nov. 4 - 1 im; P5, Off Pt. Grey, 80 m. nat. dredge, Nov. 2 - 2 im;
1978: V1, Off Spanish banks, 3-8 m anat dredge, July 4 - 1 ♀ ov. (photo'd); V2, off Spanish Banks, 8 m. nat. dredge, July 4 - 2 ♀♀ (photo'd).

Diagnosis: Female ovig. (6.5 mm.). Body smooth. Rostrum short, about 0.25x peduncular segment 1 of antenna 1, apex acute. Eye large, lateral. Antenna 1 long, about 0.5x body length; peduncular segment 1, length ~ 2.3x segment 2; segment 2 ~ 1.5x peduncle 3; flagellum ~26-segmented, length ~3x peduncle, posterodistal aesthetases prominent; accessory flagellum extremely short and flat, apically with 2 short plumose setae. Antenna 2 slightly shorter than antenna 1; flagellum ~21-segmented.

Upper lip strongly bilobate and asymmetrical. Lower lip, mandibular lobes obliquely subovate, widely separated by flat inner lobes. Mandible, incisors 7-8 dentate; left lacinia 9-dentate; accessory spine rows with 7-9 slender blades, right distal blade chisel-shaped; molar columnar, grinding surface lacking ridges; palp segment 3, inner margin with 6-7 strong pectinate D setae, apex with 3 medium long E setae; segment 2, inner margin setose; segment 1 about 0.33x segment 2. Maxilla 1, short inner plate with 1 long apical plumose seta; spine-teeth of outer plate slender, multi-cusped; palp segments broad, > outer plate, rounded apex with with 10 apical/subapical spines and 9-10 submarginal setae; segment 1 with single distolateral seta. Maxilla 2, subequal,inner plate short slightly broadened, inner marginal stout seta inserted near base of apical setae; outer plate larger, with numerous apical setae. Maxilliped, inner plate short, truncate apical margin with 5 button spines and 5 setae, inner margin with 5-6 longer setae; outer plate medium, reaching half way along palp segment 2, outer margin distally setose, apex with 5 long setae and a small inner marginal tooth; palp segments 1-3 subequal in length; segment 2 slightly broadest, 3 narrowest, with mediodistal sloping shelf; dactyl slender, slightly curved, and slightly shorter than segment 3.

Coxae 1-3 subrectangular, posteroventrally 3-4 cuspate; coxa 1 short, broad, directed forward; coxae 2-3 narrow, rounded below. Coxa 4 deepest, little broadened, ventral and posterior margins nearly straight. Coxae 5-6 shallowly posterolobate; coxal 7 rounded below. Coxal gills sac-like, subovate, medium large.

Gnathopods 1 & 2 relatively small; bases setose anteriorly. Gnathopod 1, carpus short, length about 0.4x propod, posterior lobe short, narrow; propod subovate, palm gently oblique, smoothly convex, lacking median triangular tooth; posterior angle with 3 clusters of stout spines; posterior margin short, bare. Gnathopod 2; merus with very small posterodistal tooth; carpal lobe narrow, extending slightly along posterior margin of propod; propod similar to that of gnathopod 1; palm relatively short and posterior margin relatively long; posterior angle with 4 clusters of stout spines; dactyl medium stout.

Peraeopods 3-4 slender; basis, anterior and posterior margins with short setae; carpus and merus subequal in length, each slightly shorter than curved propod, posterior margin with pairs of short spines; propod, posterior margin with 3 pairs of short spines; dactyl slender, length about 0.5x propodus. Peraeopods 5-7 subsimilar; bases increasing in size posteriorly, posterior margins sharply rounding to shallow posterodistal lobes; segments 4-6 slender, segment 6 longest; dactyls slender, slightly larger than in peraeopods 3 & 4.

Epimeral plates 1-3, ventral margins with short spines, posteroventral corners acute, not strongly produced. Pleopods normal, not sexually dimorphic. Uropod 1, peduncle slender, with short distolateral spine; rami subequal, about equal in length to peduncle margins strongly serially spinose. Uropod 2, peduncle shorter than rami; outer ramus short, about 0.6x inner ramus. Uropod 3, peduncle short, about 0.7x outer ramus; inner ramus, length about 1.5x outer ramus, with 6-8 serially arranged marginal pairs of spines.

Telson subrectangular, distally rounded, length about 1.7x width, exceeding peduncle; median ventral keel, plumose penicillate setae inserted marginally and slightly distad of midpoint.

Male: similar, slightly smaller.

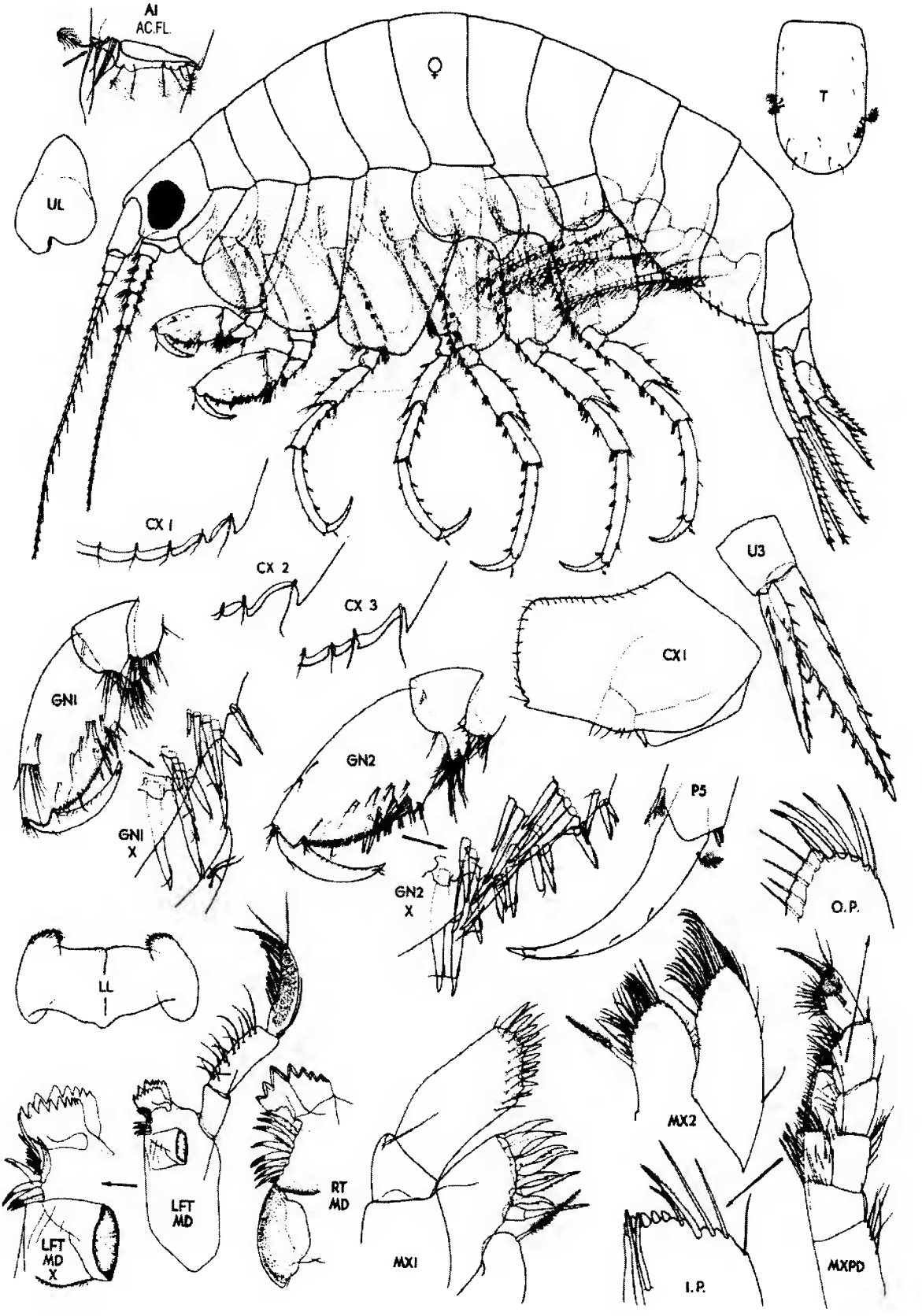

Fig. 24. ***Kamptopleustes spinosus*** n. sp. Female ov (6.5 mm). Trevor Channel, Barkley Sound, B. C.

Distributional Ecology: Southeastern Alaska to southern British Columbia, subtidal mud and sandy mud,to 80 m depth.

Etymology: From the Latin *spinosa* (full of spines), with reference to the relatively large number of spine clusters at the posterodistal angle of the gnathopod propods.

Remarks: *Kamptopleustes spinosus* differs from *P. coquillus* in the larger eye, short peduncular segment 2 of antennna 1, short and more sharply bent coxa 1, and more slender peraeopods

Kamptopleustes kamui (Ishimaru)
(Fig. 25)

Pleusymtes kamui Ishimaru, 1985: 50, figs. 6-9;—Barnard & Karaman 1991: 652;—Ishimaru 1994: 55.

Material Examined:
Kushiro, Hokkaido, Japan, sand, 52 m depth, Y. Hanamura et al coll., Nov. 22, 1981 - ♀ br. II (8.0 mm)(slide mount),CMNC 2004-0096.

Remarks: The single female specimen examined exhibits most of the character states of genus *Kamptopleustes,* as here defined. The species was initially assigned to the genus *Pleusymtes.* However, it does not conform with any of the subgroups of *Pleusymtes* because of the following combination of character states: rostrum small, short; antenna 1, peduncle 1 lacks posterodistal process; maxilla 1, palp broad, basal segment with seta; coxa 1 strongly bent forwards; coxae 2-4 sharply deeper and larger; gnathopod palmar margins lack submedian tooth; urosome totally occluded dorsally; uropod 1, rami subequal; uropod 2, outer ramus long, 0.8x inner ramus.

Kamptopleustes kamui differs from N. American species in the following character states: antenna 1, peduncular segment 1 lacking posterodistal process; maxilliped inner plate with 6 apical button spines; palmar margin of gnathopods spinose. Although exhibiting a dorsally occluded urosome 2, *K. kamui* differs from *Rhinopleustes*, and the *pribilofensis* subgroup, in lacking a strongly enlarged antennal peduncular segment 1 and posterodistal tooth. The species tends to bridge character states of *Kamptopleustes, Rhinopleustes,* and *Pleusymtes,* but in balance is most closely assignable to *Kamptopleustes.*

Pleustostenus Gurjanova

Pleustostenus Gurjanova, 1972: 173;—Barnard & Karaman 1991: 651.

Type species: *Pleustostenus displosus* Gurjanova, 1972.

Remarks: The genus *Pleustostenus* Gurjanova, 1972, is monotypic, based on a single large specimen (lacking abdomen) from mid-depths of the Sea of Okhotsk. Some clarification of her original description may be needed. Thus, Gurjanova described the mandibular molar as large and triturative, similar to that of *Stenopleustes malmgreni*, yet her illustration (adapted here, Fig. 26A) depicts the molar as a weakly developed rounded stub. Maxilla 1, outer plate, appears to have only 5-6 apical spines, also typical of Stenopleustinae, but this may be an illustrative artifact.

Some character states seem more typical of subfamily Neopleustinae. Thus, the mandibular palp is very large, length more than twice that of the mandibular body; segment 3 with 18-20 inner marginal D setae; the inner plate of maxilla 2 possesses a strong inner marginal seta separated from the apical setae, and the maxilliped palp segments are slender, with segment 3 projecting distally beyond the base of the elongate dactyl. Furthermore, the large coxal plates are disjunct between coxae 1 & 2, the hind margin of coxa 4 is strongly excavate posterodistally, the gnathopods are subsimilar in size and form and the bases are strongly setose anterodistally.

At our request, Dr. Nina Tzvetkova has recently reexamined the type slide of *P. displosus* in the Zoological Institute, St. Petersburg. Her commentary and accompanying sketches confirm Gurjanova's description of the mouthparts, with the exception of the spine-teeth of maxilla 1, which are missing on the type slide, and therefore remain indeterminate.

With her kind permission, Dr. Tzvetkova's sketches of the mandible are reproduced here (Fig. 26B). The left mandibular molar is large, the apical grinding surface triturative, and margin finely toothed. The left lacinia is 10-dentate; incisor 10-12 dentate; and spine row with 9 blades. In the right mandible, the molar and grinding surface are similarly strong, but the incisor is 9-10 dentate, and the spine row has 6-7 blades, distal to which appears a broadly bifid blade-like process suggestive of a right lacinia mobilis (or modified distal blade).

The placement of *Pleustostenus* within pleustid subfamilies, as currently defined, is problematical.

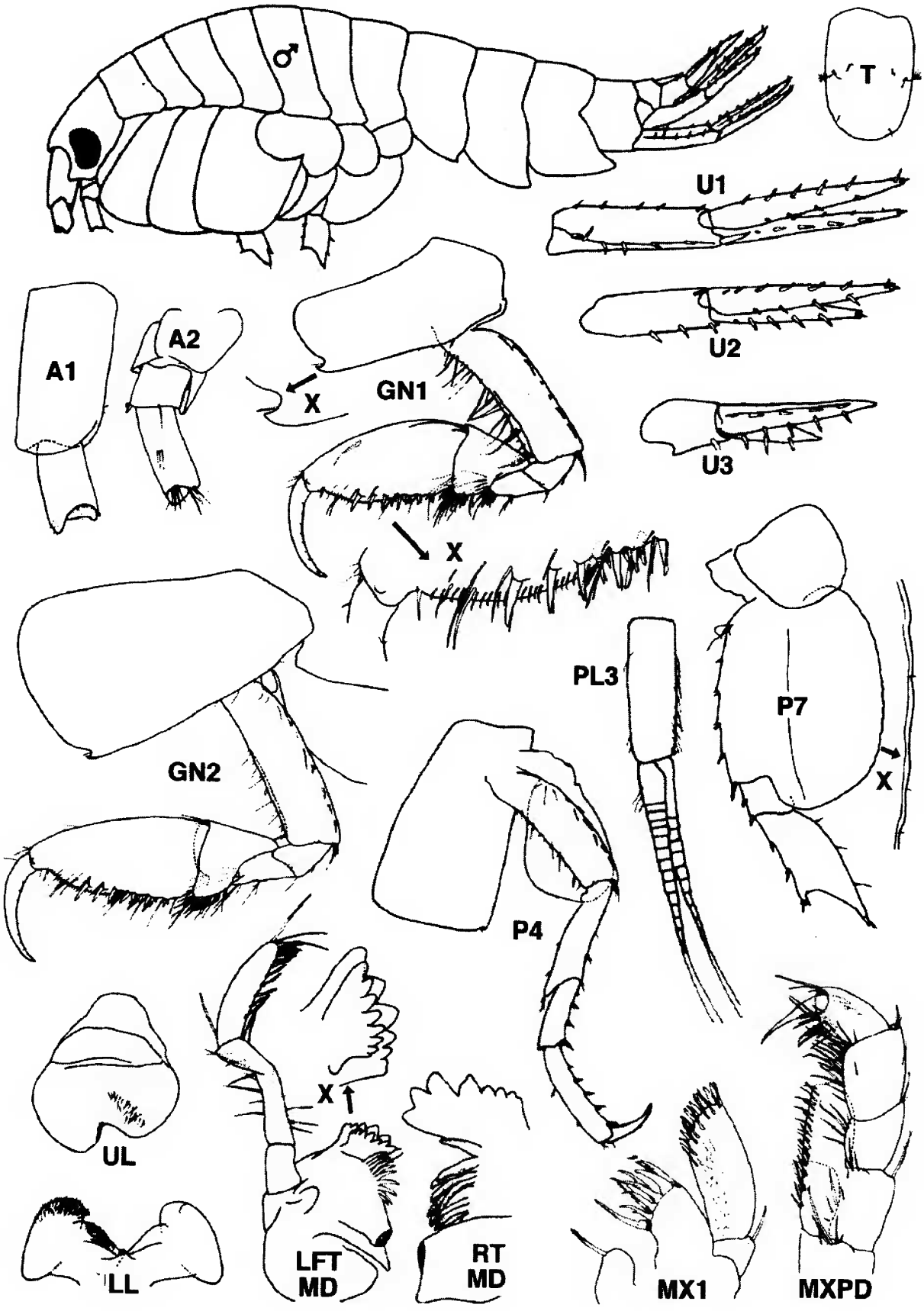

Fig. 25. *Kamptopleustes kamui* (Ishimaru). Male (7.5 mm). Okhotsk Sea. (modified from Ishimaru 1985).

Gurjanova (1972) had initially allied the genus with *Stenopleustes*. Barnard and Karaman (1991, p. 644) keyed *Pleustostenus* with *Mesopleustes, Pleusymtes, Stenopleustes* and other genera having a triturating mandibular molar. Bousfield & Hendrycks (1994) had interpreted Gurjanova's figure of the mandibular molar as knob-like and non-triturative and, cognizant of other neopleustinid character state (above), placed *Pleustostenus* within subfamily Neopleustinae.

In *Pleustostenus,* the mouthparts combine character states of Neopleustinae,with some primitive genera of Pleusymtinae (e.g., *Anomalosymtes*). Because the abdomen of the type specimen is missing, important character states of appendages of pleosome, urosome and telson are indeterminate. The genus is therefore tentatively placed as an aberrant form within the Pleusymtinae that may be transitional to the Neopleustinae.

NEOPLEUSTINAE Bousfield & Hendrycks

Genera: *Neopleustes* Stebbing, 1906; ***Shoemakeroides***, n. g. (p. 100).

Diagnosis: Body usually dorsally carinate or mucronate. Urosome 2 partly or fully occluded dorsally. Rostrum medium, extending beyond head lobe. Antenna 1, peduncular segment 1 not produced anterodistally.

Lower lip usually broad, shallow. Mandibular molar reduced, non-triturative; left lacinia multidentate, right lacinia lacking; blades normal, slender; palp large. Maxilla 1, outer plate with 9 apical spine-teeth, inner plate with single apical seta. Maxilla 2, inner plate with 1-2 inner marginal stout setae. Maxilliped plates short; palp slender, segment 3 variously produced distally; dactyl slender, pectinate.

Coxae 1-4 medium, deepening gradually posteriorly; coxae 1-3 variously with posterodistal cusp(s); coxa 1 not markedly bent forwards; coxae 5 & 6 posterolobate. Coxal gills medium, sac-like, lacking on peraeopod 7.

Gnathopods typically subsimilar, weak to medium strong, or unlike and slightly sexually dimorphic, often powerfully subchelate; propodal palms with triangular median tooth; meral posterodistal tooth lacking or weak; carpus usually elongate, lobe shallow.

Peraeopods 5-7 subequal in size and form. Epimeral plates 2 & 3 variable, hind corner usually produced. Uropod 1 with strong mediodistal peduncular spine. Telson keeled proximally, apex rounded.

Remarks: Subfamily Neopleustinae is close to Parapleustinae (Bousfield & Hendrycks 1994: 67) but differs in its well developed, often keeled, rostrum, dorsal body processes, large mandibular palp, unspecialized molar blades; processiferous maxillipedal palp segment 3, strongly cuspate coxae 1-4, and midventrally keeled telson. Its few members occur deeply subtidally in arctic and subarctic waters.

Neopleustes Stebbing

Neopleustes Stebbing, 1906: 311;—Gurjanova 1972: 163;—Barnard & Karaman 1991: 649.

Type species: *Amphitoe pulchellus* Kroyer, 1846

Species: *Neopleustes boecki* (Hansen, 1887) (see also Sars 1893: 348, pl. 122.2); *N. euacanthoides* Gurjanova, 1972; *N. carinatus* Margulis, 1963; ***N. columbianus*** n. sp. (p. 96); *N. kussakini* (Budnikova, 1995); *N. pulchellus* (Kroyer, 1846).

Diagnosis: Body middorsally carinate or mucronate, rarely smooth. Rostrum medium to strong, often keeled. Antenna 1 elongate, often longer than body. Antenna 2 distinctly shorter than antenna 1.

Lower lip, outer lobes oblique, widely separated by low flat inner lobes. Mandibular molar process small, thumb-like, without triturating surface; left lacinia 9-dentate; palp powerful, length exceeding by 2-3 times that of the mandibular body. Maxilla 2, inner plate, inner marginal seta set apart basally from apical setae. Maxilliped, inner plate truncate, with 4 apical button spines; outer plate slender; palp segments slender; segment 3 with short, outer distal conical projection, dactyl articulated from its medial side.

Coxa 1-4 medium, increasing in size posteriorly; coxa 1 not bent forwards distally, posterodistally cuspate. Coxal gills medium, sac-like.

Gnathopods 1 & 2 weakly subchelate, subsimilar; meral tooth weak or lacking; carpus elongate, shorter than propod, posterodistal lobe shallow; propod with short, oblique, weakly toothed palmar margin; posterior margin setose.

Peraeopods 5-7 regular, homopodous, bases usually convex behind. Epimeral plates 2 & 3, hind corners acute, produced. Uropod1 with distolateral peduncular spine; rami subequal.

Telson with proximal keel.

Remarks: *Neopleustes* differs from ***Shoemakeroides*** mainly in the more strongly developed rostrum, more strongly cuspate coxae 1-3, and smaller gnathopods in which the propods are subsimilar in form, and the carpi elongate.

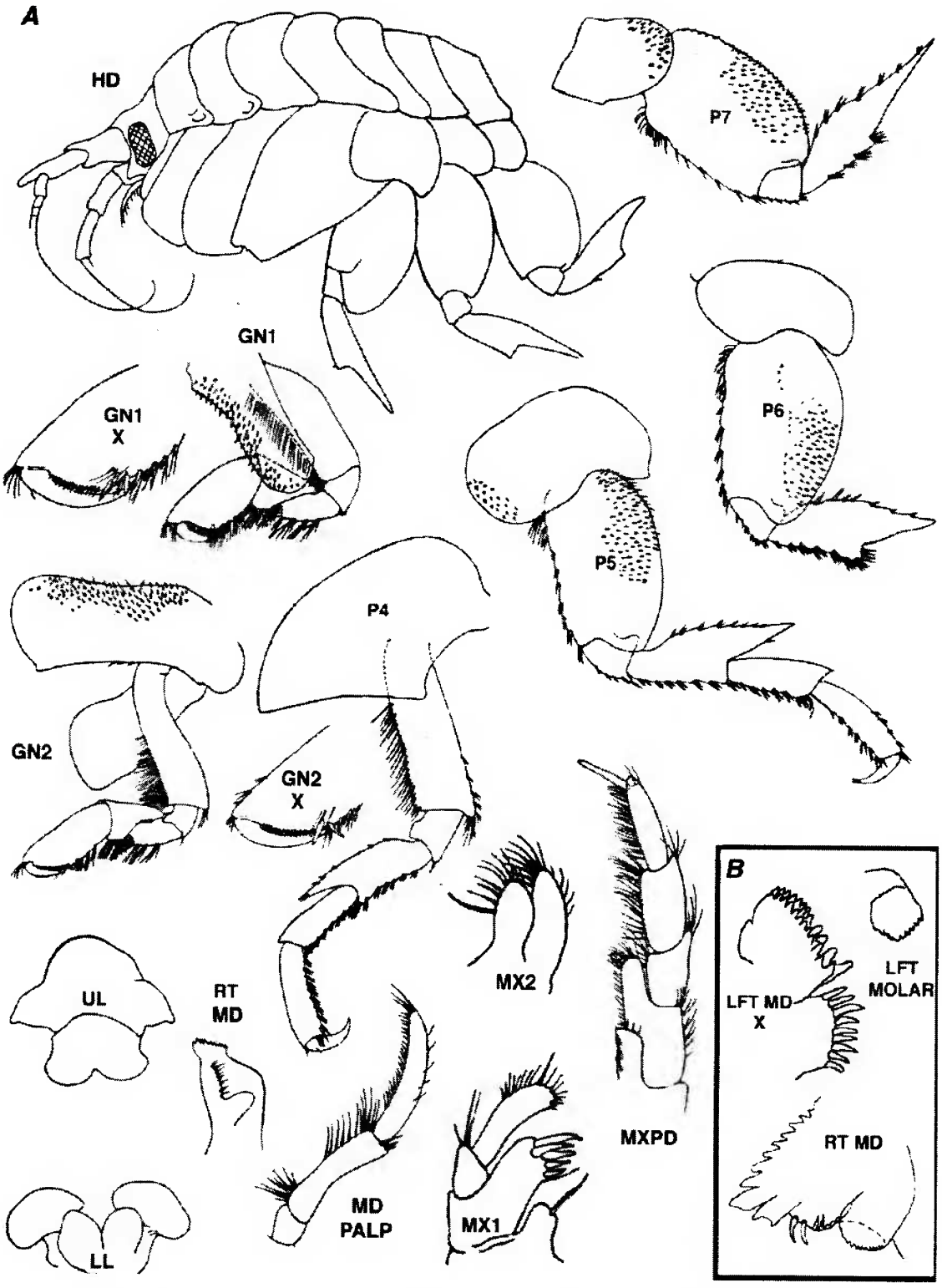

Fig. 26. *Pleustostenus displosus* Gurjanova. Female ov (to 15 mm). Sea of Okhotsk.
A. Modified from Gurjanova (1972).
B. Illustrations of type material courtesy of Dr. N. L. Tzvetkova, Zoological Institute.

Neopleustes columbianus n. sp.
(Fig. 27)

Material Examined.
SE ALASKA, K. E. Conlan Stns, 1989:
Stn 89-2-43, Eureka Channel, small island south of Barrier Islands (56° 46.2' N, 132° 25.7'W), June 26 - 1 ♀ ov (6.2 mm); Stn 89-2-21, Torch Bay (58°19.8N, 135° 46.3W), 7.6 m, June 18 - 2 ♀♀ ov (6.7 mm), 2 ♂♂ (4.5 mm) 1 im. CMN collns.

BRITISH COLUMBIA:
North Central coast:
Nass River estuary, 45 m sill, P. Shaw coll., Oct. 24, 1983 - 1 ♂ (6.5 mm) **holotype** (slide mount), CMNC 2004-0133.
South Central coast:
Stn B1, Burrard Inlet, 71 m, mud, C. Levings coll., Sept. 1, 1977 - 1 im (3.3 mm) (slide mount), CMN collns.

Diagnosis: Male (6.5 mm). Body, peraeon segments 1-3 with weak carinations, and strongly carinated posteriorly from segment 4 to pleon segment 2, mid-dorsal tooth on pleon 3. Head with anterodorsal crest. Rostrum short, about 0.2x peduncular segment 1 of antenna 1, apex rounded; anterior head lobe triangular, apically subacute, lateral cephalic lobe very deeply recessed sinus, anteroventral corner of the head acute. Eye large, round, pigmented. Antenna 1 very long, equal to body length; peduncular segment 1 elongate and strong, equal to segments 2 and 3; flagellum length about 4.6x peduncle, ~58-segmented, posterodistally with aesthetascs and short setae. Antenna 2 shorter than antenna 1, flagellum ~35 segmented.

Upper lip apically bilobate and asymmetrical. Lower lip, outer lobes rounded, steeply angles, widely separated by flat inner lobes. Mandible, incisor margins with 7-10 teeth; left lacinia 7-dentate, right lacinia absent; accessory spine rows with 7-8 blades; molar a small, non-triturative rounded knob; palp very large; segment 3, inner margin lined with strong pectinate D setae, apex with 3 long strong pectinate E setae; segment 2, inner margin nearly bare; segment 1 about 0.4x segment 2. Maxilla 1, inner plate with 1 strong pectinate apical seta; outer plate , apical spine-teeth slender, multi-cusped; palp slender, extending beyond outer plate, apex narrow, subtruncate, with 4 apical spines and 6-7 subapical setae. Maxilla 2, inner plate slightly short and broader than outer plate; inner margin with 2 slender plumose setae, proximal setae inserted apart from apical setae. Maxilliped, inner plate very short, not reaching basal article of palp, apex subtruncate, with 1 button spine and a few slender setae; inner margin with short setae; outer plate short, reaching base of palp article 2, apex narrowly subtruncate, with a few slender setae; palp large; segment 1-3 increasingly in length slightly distally; segment 3 narrow, with inner marginal pectinate setae and medial facial micropectinations; dactyl slender, nearly straight, with single row of facial micropectination, inserted subapically on segment 3.

Coxal plates 1-3 posteroventrally multi-cuspate, lower margins sharply rounded; coxa 4 relatively narrow, rounded below; coxal plates 5-6 broadly posterolobate; coxa 7 subquadrate. Coxal gills relatively small, sac-like.

Gnathopods 1 & 2 small, weakly subchelate, subsimilar. Gnathopod 1, basis with anterior marginal setae; carpus medium long, about 0.7x propod, posterior lobe broad, shallow; propod subrectangular, narrow, palm oblique, nearly straight, with small mid-palmar tooth, posterodistal angle with 3 clusters of slender spines; posterior margin with 2-3 setal clusters. Gnathopod 2 similar to gnathopod 1 but slightly larger; carpal lobe slightly longer, not produced; propodal palm similarly oblique, with slightly smaller mid-palmar tooth; posterodistal angle with 2 clusters of slender spines; dactyl slender.

Peraeopod 3-4 medium strong; basis, length ~ 5.3x width, anterior and posterior margins with short setae; merus anterodistally produced, acute; carpus slightly shorter than merus, posterior margins with 3 clusters of short spines; propodus slightly longer, posterior margin with 4-5 spine clusters; dactyls slender, length about 0.5x propod. Peraeopods 5-7 closely homopodous in form and size; bases slightly increasing posteriorly, round behind to shallow posterodistal lobes; segments 4-6 medium stout, margins with spine clusters.

Epimeral plates 1-3, lower margin with short spines, posteroventral corners acute, produced. Pleopods regular, not sexually dimorphic. Uropod 1, peduncle and rami subequal in length, margins of rami with serially arranged short spines. Uropod 2, peduncle slender, length = outer ramus, inner ramus about 1.3x outer ramus. Uropod 3, peduncle short; outer ramus short, length about 0.6x inner, inner and outer margins serially spinose; inner ramus with 6 pairs of marginal short spines.

Telson, short, distally rounded, length about 1.5x width, not exceeding peduncle, with ventral keel; paired plumose penicillate setae inserted submarginally distad of mid point.

Female: unknown.

Etymology: The geographical species name refers to its occurrence in British Columbia.

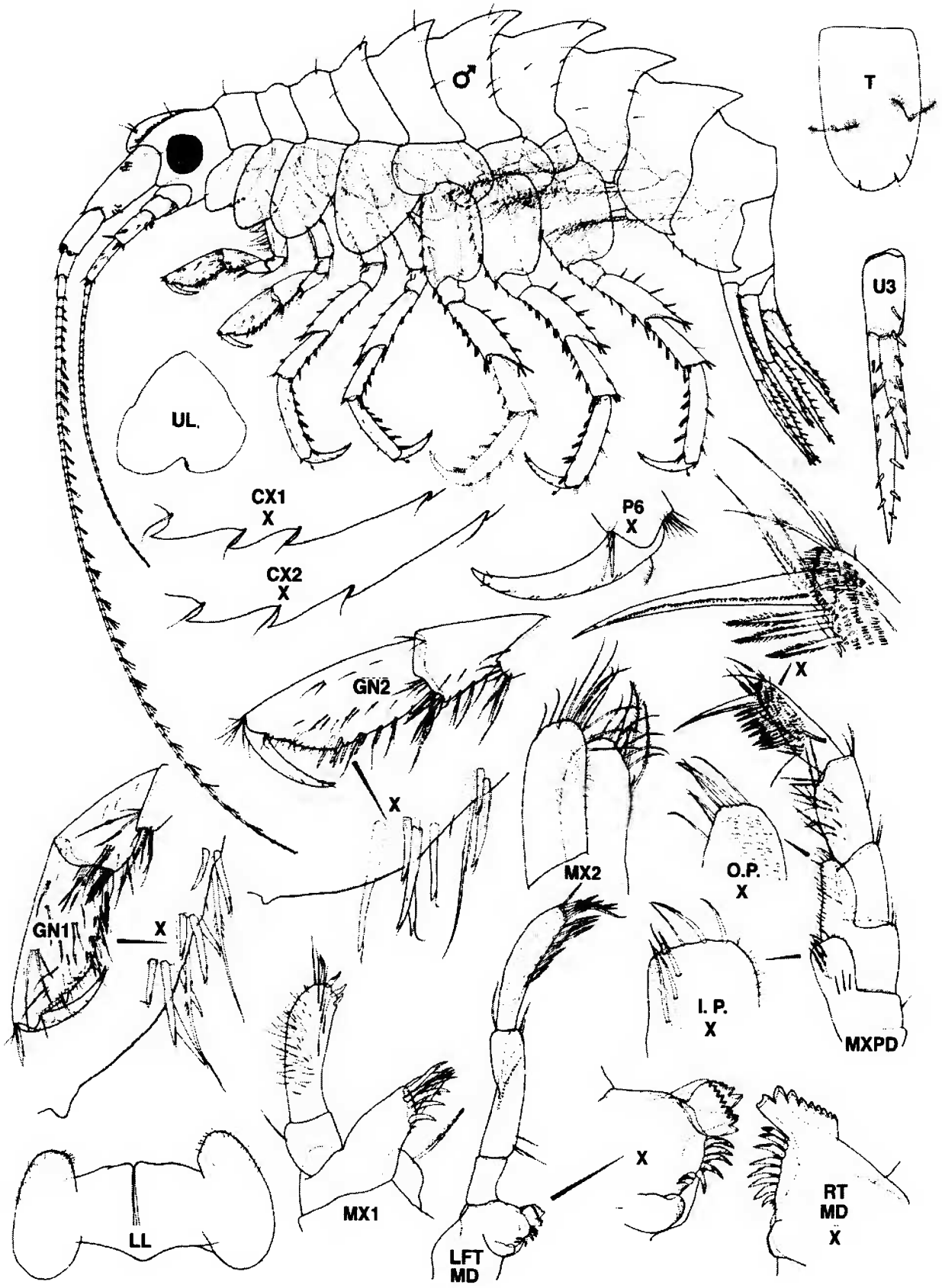

Fig. 27. *Neopleustes* ***columbianus*** n. sp. Male (6.5 mm). Nass R. estuary, B. C.

Key to North Pacific genera & species of subfamily Neopleustinae
(including *Pleustostenus*)

1.Gnathopods 1 & 2 strongly unlike in size and form (esp. ♂) . . . . . ***Shoemakeroides*** n.g. . 2.
Gnathathopods unlike in size, similar in form . . . . . 3.

2. Pleon segment 3 with strong dorsal process; urosome 2 dorsally narrowed; peraeopod 5, basis narrow, not broadened as in peraeopod 7 . . . . . *S. gagarae* (Gurjanova) (p. 102)
Pleon segment 3 with small middorsal knob; urosome dorsally occluded by urosome 1 & 3; peraeopod 5, basis broadly rounded behind . . . . . *S. cornigerus* (Shoemaker) (p. 100)

3. Antenna 2, peduncular segment 2 with anterodistal process strongly overhanging segment 3; body weakly carinate; coxae 2 & 3 large, hind corners with 1-2 small cusps . . . . *Pleustostenus displosus* Gurjanova (p. 92)
Antenna 2, peduncular segment 2 normal, not overhanging segment 3; body strongly carinate; coxae 2 & 3 medium, hind corners with 1- 5 distinct cusps . . . . . *Neopleustes* 4.

4. Coxae 1-3 narrowing distally (below), posterodistal margin with 2-3 cusps; pleon segment 3 with upward pointing process . . . . . .5.
Coxae 1-3 rounded below. hind corners with 1-2 cusps; pleon segment 3 lacking process . . . . . 7.

5. Head with strong anterodistal ridge; peraeron segments 1-4 variously carinate . . . . . 6.
Head lacking middorsal ridge; peraeon segments 1-4 smooth above . . . . . *N. pulchellus* (Kroyer) (p. 98)

6. Coxa 4 strongly excavate posterodistally; coxa 1 strongly attenuated below; peraeopod 7, basis narrowed behind . . . . . *N. euacanthoides* Gurjanova
Coxa 4 normal, slightly convex behind; coxa 1 regularly narrowing below; peraeopod 7, basis rounded behind . . . . . ***N. columbianus*** n. sp. (p. 96)

7. Peraeon 5 & 6 carinate; peraeopods 5-7, bases unequally broad . . . . . *N. kussakini* (Budnikova) (p. 98)
Peraeon segments 5 & 6 smooth; peraeopods 5-7 bases subequal in form. . . . . 8.

8. Head with strong anterodistal ridge; pleon strongly carinate. . . . . *N. boecki* (Hansen)
Head lacking dorsal ridge; pleon carinations low . . . . . *N. carinatus* Margulis

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Distributional Ecology: SE Alaska to southern British Columbia, on mud, at 7.6-71 m depth.

Remarks: The dorsal carinations of *Neopleustes columbianus* extend from anterior peraeonal segments to pleon segment 5. They are intermediate in size between the very large extensive carinations of *N. euacanthoides* and the relatively small carinations of the type species *N. pulchellus* that do not occur on anterior peraeonal segments.

Neopleustes pulchellus Kroyer

Amphithoe pulchella Kroyer,1838: figs. 2a-r;—G. O. Sars, 1893: 346, pl. 122.1.
Neopleustes pulchellus Stebbing 1906: 312;—Shoemaker 1930: 306;—Barnard & Karaman 1991: 649;—Brunel et al 1998: 198;—Bousfield 2001a: 94.
Parapleustes pulchellus Dunbar 1954: 751.
Parapleustes pulchella Shoemaker 1955: 43.

Remarks: Although *N. pulchellus* is the generic type, it differs from the North Pacific complex of species in its lack of anterodorsal head ridge and restricted dorsal body carinations.

?Neopleustes kussakini (Budnikova)
(Fig. 28)

Parapleustes kussakini (?) Budnokova, 1995 :15, figs. figs. 4-7.

Diagnosis: With a few limitations (e.g., coxal gills) the species is fully described and figured by Budnikova (loc. cit).

Remarks: *N. kussakini* seems reasonably well placed within genus *Neopleustes* on the basis of: its rostrate head; strong posterior peraeonal and pleonal middorsal carinations; broad shallow lower lip; subsimilar gnathopods with propodal palmar tooth; and distal

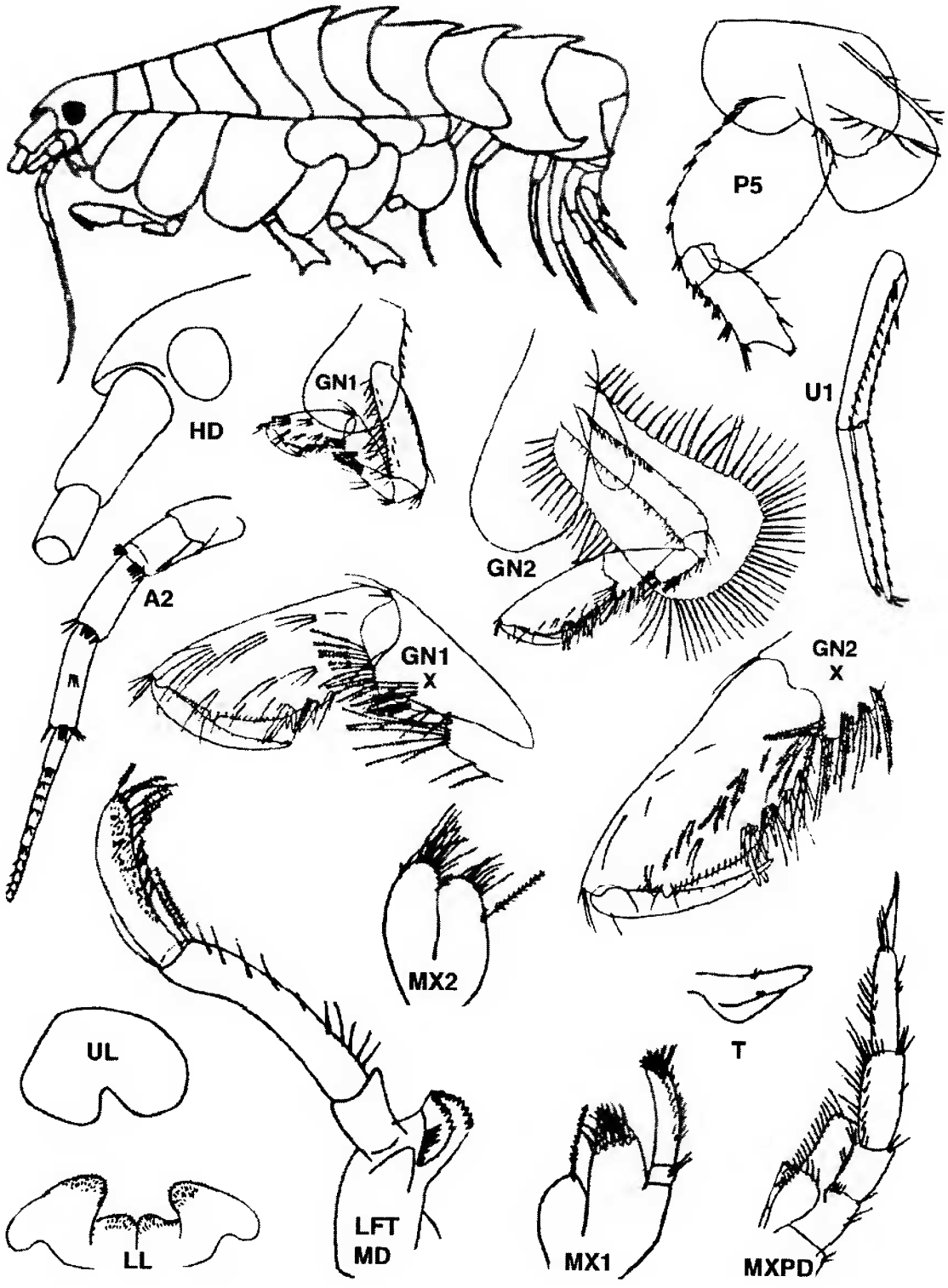


Fig. 28. *Neopleustes kussakini* (Budnikova). Female ov (8.3 mm). West Sakhalin I. (modified from Budnikova 1995)

spine on peduncle of uropod 1 (not clearly shown but mentioned in text). The species does not conform with other genera within Neopleustinae (see key, p. 98).

In Budnikova's fig. 7, what appears to be a small setose brood plate attached to the coxal plate of peraeopod 7 may be an oversight. Although the maxilliped palp and dactyl are slender, the distal process of palp segment 3 is present but not conspicuous (Tzvetkova, pers. commun.).

Neopleustes boecki (Hansen) shares with *N. columbianus* a dorsally keeled head, strongly produced anterior head lobe, and tricuspate hind corners of coxae 1-2, However, its posterior body carinations are confined to the pleon and peraeon segment 7, and the bases of peraeopods 5-7 are broadly rounded behind.

Shoemakeroides n. g.

Sympleustes (part) Shoemaker 1964: 408.
Stenopleustes (part) Gurjanova 1972: 160.
Parapleustes (part) Karaman & Barnard 1979: 113;—Barnard & Karaman 1991: 649 .

Type species: *Sympleustes cornigera* Shoemaker, 1964 (present designation).

Species: *Shoemakeroides gagarae* (Gurjanova, 1972).

Diagnosis: Body strongly carinate on peraeon segments 6 & 7 and pleon. Urosome 2 occluded dorsally or nearly so. Rostrum short, lacking anterodorsal ridge. Antenna 1 much longer than antenna 2; peduncular segments 1 & 2 long, lacking distal processes; segment 3 short; accessory flagellum minute, flat, with short apical setae. Antenna 2, peduncular segments 4 & 5 subequal, margins bare.

Upper lip shallowly notched apically and slightly asymmetrical. Lower lip, inner lobes prominent, "humped", outer lobes widely apart. Mandibular molar small, stub-like, triturating surface very small or lacking; left lacinia 8-10-dentate, right lacinia lacking; blades 8-14, slender; incisors irregularly toothed; palp stout, elongate, segment 3 with 11-14 distal E setae and 2-3 medium length apical setae. Maxilla 1, inner plate single seta present or lacking (may be fringed with fine setules); outer plate with 9 apical spines; palp broadend, with 7 apical spines and fine surface setules; proximal segment may have marginal seta. Maxilla 2 inner lobe little broadened, with 1-2 inner marginal stout setae somewhat remote from apical setae. Maxilliped, inner plate broadened, with 6 apical button spines; outer plate short; palp large, segments subequal in length, segment 3 slightly produced distally; dactyl slender curved. Coxae 1-4 short, rounded, slightly increasing in depth and size. Coxa 1 hatchet-shaped, slightly produced forward distally, with minute posterodistal cusp. Coxa 5 & 6 posterolobate.

Gnathopods powerful, dissimilar in size and form, not sexually dimorphic (Shoemaker loc. cit). Gnathopod 1, basis, anterior margin setose distally; carpus medium, lobe broad, shallow; propodal palmar margin smooth, with submedian tooth, lacking spines except at posterodistal angle; hind margin strongly setose; dactyl medium. Gnathopod 2, merus with small postero-distal tooth; carpus short, lobe narrow; palmar margin irregular, excavate, with spines at posterodistal angle leading onto palm, with large bifid tooth near hinge, hind margin setose; dactyl strong.

Peraeopods 3-7 strong, segment 4 longest, 5 shortest; dactyls strong. Peraeopods 5-7, bases narrow, increasing posteriorly, hind margin nearly straight.

Epimeral plate 3, hind corner produced, acuminate. Uropod 1, peduncle with distolateral spine, peduncle about as long as the subequal rami. Uropod 2, outer ramus distinctly shorter. Uropod 3, outer ramus ~1/2 length of inner ramus.

Telson linguiform, longer than wide, keeled slightly proximally, distal margins witha few short spines.

Etymology: The generic name honours the late Clarence R. Shoemaker who first described the generic type species and who contributed very broadly to knowledge of amphipods of the North Pacific region. Gender masculine.

Remarks: *Shoemakeroides* conforms essentially with the diagnosis of subfamily Neopleustinae in the dorsally carinated body, strong peduncle of antenna 1, shallow coxal plates, and mouthpart structure, especially of the mandible. It differs mainly in the short rostrum, maxilliped having 6 rather than 4 apical button spines on the inner plate, and the weak distal process on segment 3 of the palp.

The taxon has been the source of some confusion, partly because the somewhat limited original description omitted some generically diagnostic character states (e.g., of some mouthparts, coxal gills, etc.). Although Gurjanova's description and figures of *S. gagarae* are accompanied by more complete figures, material of Shoemaker's species *S. cornigerus* is available for this study and is therefore selected as the generic type.

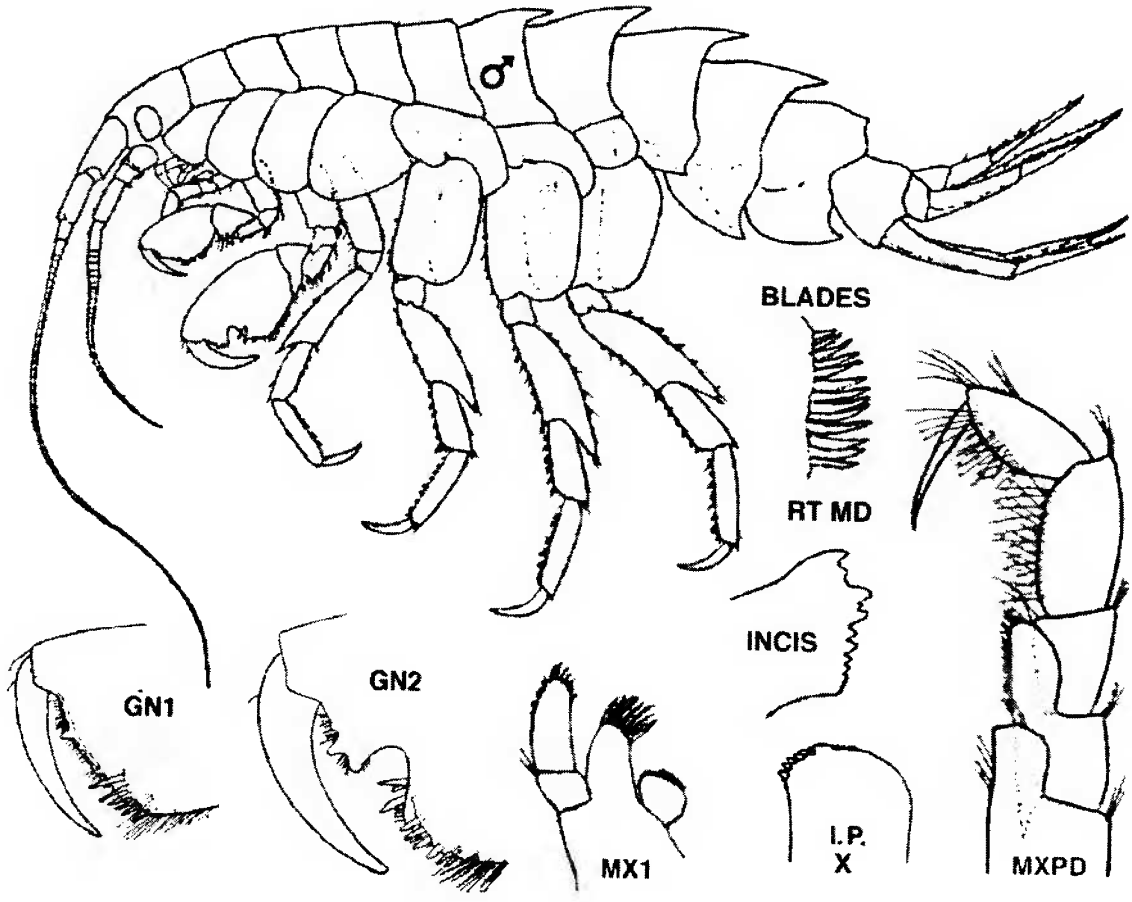


Fig. 29. *Shoemakeroides cornigerus* (Shoemaker). Male (24 mm). Aleutians, Gulf of Alaska , ~900 m. (after Shoemaker 1964)

Shoemakeroides cornigerus (Shoemaker)
(Figs. 29, 30)

Sympleustes cornigera Shoemaker, 1964: 408, fig. 9;—Bousfield 2001: 94.
Stenopleustes cornigera Gurjanova 1972: 160.
Parapleustes cornigerus Karaman & Barnard 1979: 113;—Barnard & Karaman 1991: 650.

Alaska
Aleutian Ids., Amchitka I., off Banjo Pt., 100 m, P. Slattery coll., Sept. 13, 1971 - 1 ♀ ov (7.4 mm) (slide mount), CMNC 2004-0060.
Gulf of Alaska, off Kodiak I., ~1800 m, in nests on hydroid colonies, Aaron Baldwin coll., May 15, 2000 - 1 ♂ (9.0 mm) (slide mount); Ibid., Lew Schumejda coll. - ♀ ov (12.0 mm), CMN colIns.

Diagnosis: Male (9. 0 mm). On the assumption of conspecificity (see remarks, below), the following character states are added to the original description of Shoemaker (loc. cit.):

Antenna 1, accessory flagellum very small, flat. Lower lip, inner lobes deep, flat; outer lobes subovate, widely spread, sloped medially. Mandibular left lacinia 9-10 dentate; molar small, apex rounded, knoblike, finely setulose, grinding surface lacking; spine row with 6-11 blades on left side, 9 on right side; left incisor with 7-8 teeth, right incisor with 9-10 teeth; palp with 14 inner marginal "E" setae and 2-4 longer unequal apical setae. Maxilla 1, inner plate with single apical seta; outer plate with 9 apical spines; palp with 5 apical spines, distal segment covered with outer facial setules, proximal segment with distolateral seta. Maxilla 2, inner plate broad, with 2 proximal inner marginal setae. Maxilliped, segment 3 slightly protruding beyond base of dactyl.

Coxal gills large, rounded, plate-like.

Urosome 2 occluded dorsally or nearly so. Pleopods normal, not sexually dimorphic. Uropod 1, peduncle with distolateral spine. Telson with deep proximomedial keel.

Female (7.4 mm): Gnathopod 2, propod, palmar mar-

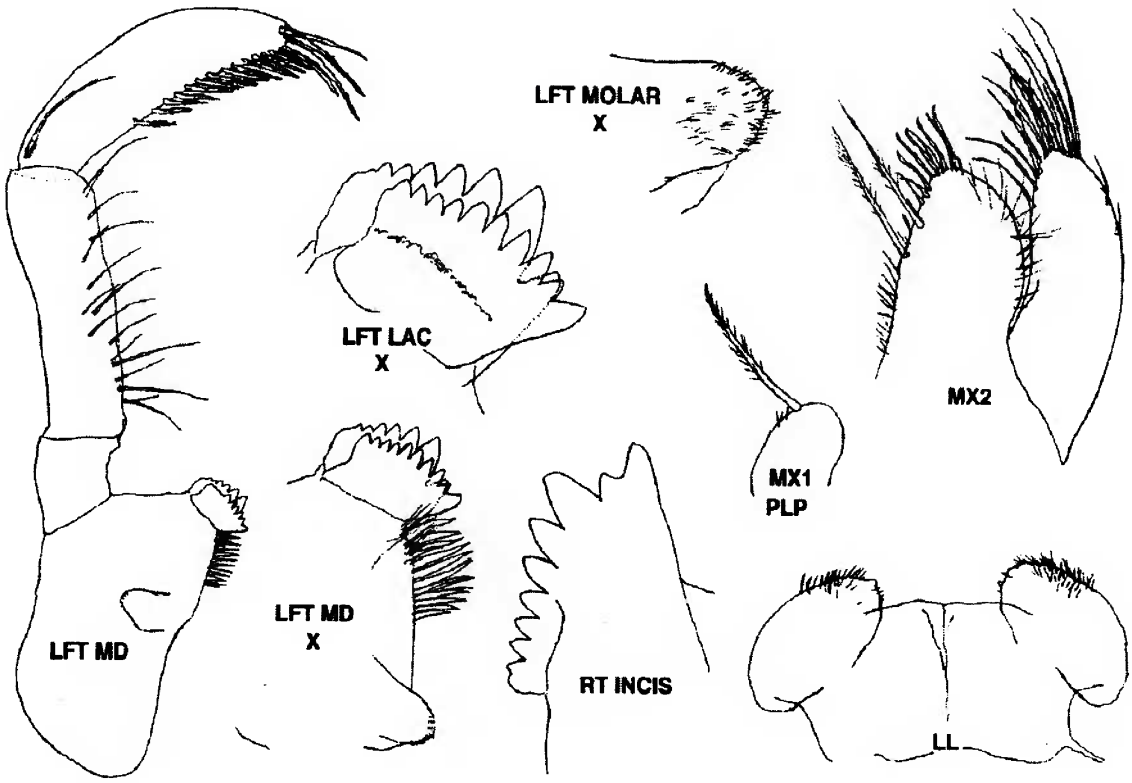


Fig. 30. ***Shoemakeroides*** *cornigerus* (Shoemaker). Male (9.0 mm). Off Kodiak I., Alaska, 1800 m.

gin with less pronounced concavity than in male. Brood plate on gnathopod 2 relatively narrow, length less than basis. Brood plates of peraeopods 3 & 4 slightly broader, that of P5 broadest but relatively short and narrowfor pleustids; all lined marginally with numerous medium long simple brood setae.

Remarks: The mature male and female specimens examined here are smaller (7.4 -9 mm) than the specimen of *S. cornigerus* examined by Shoemaker (24 mm) and lack a dorsal carination on peraeon 6.

Shoemakeroides gagarae (Gurjanova)
(Fig. 31)

Stenopleustes cornigera gagarae Gurjanova 1972: 160, figs. 16, 17.
Parapleustes gagarae Karaman & Barnard 1979: 113; Barnard & Karaman 1991: 650.

Diagnosis: Female (12 mm). As described and figured by Gurjanova (1972), except for the left and right mandibles for which details are not provided. The species differs from *S. cornigerus* mainly in gnathopod 2, the propodal palmar margin of which less strongly notched and toothed, the narrower bases of peraeopods 5-7, and the stronger carination of urosome segment 1.

Remarks: The species was removed from genus *Stenopleustes* and transferred to genus *Parapleustes* by Karaman & Barnard (loc. cit.), mainly on the basis of non triturative grinding surface of the mandibular molar. In detailing the following non-*Stenopleustes* character states, the present study confirms this removal: maxilla 1, outer plate with 9 apical spines; maxilla 2, inner plate with strong inner marginal seta(e); urosome segment 2 dorsally occluded or nearly so; epimeral plate 3 with produced hind corner.

In the present view, *Shoemakeroides* is also excluded from subfamily Parapleustinae on the basis of its strongly carinated dorsum, elongate peduncular segments 1 & 2 of antenna 1; large mandibular palp; shallow coxal plates 1-4; and strongly dimorphic gnathopods. The balance of character states suggests an interim best fit of the genus within subfamily Neopleustinae.

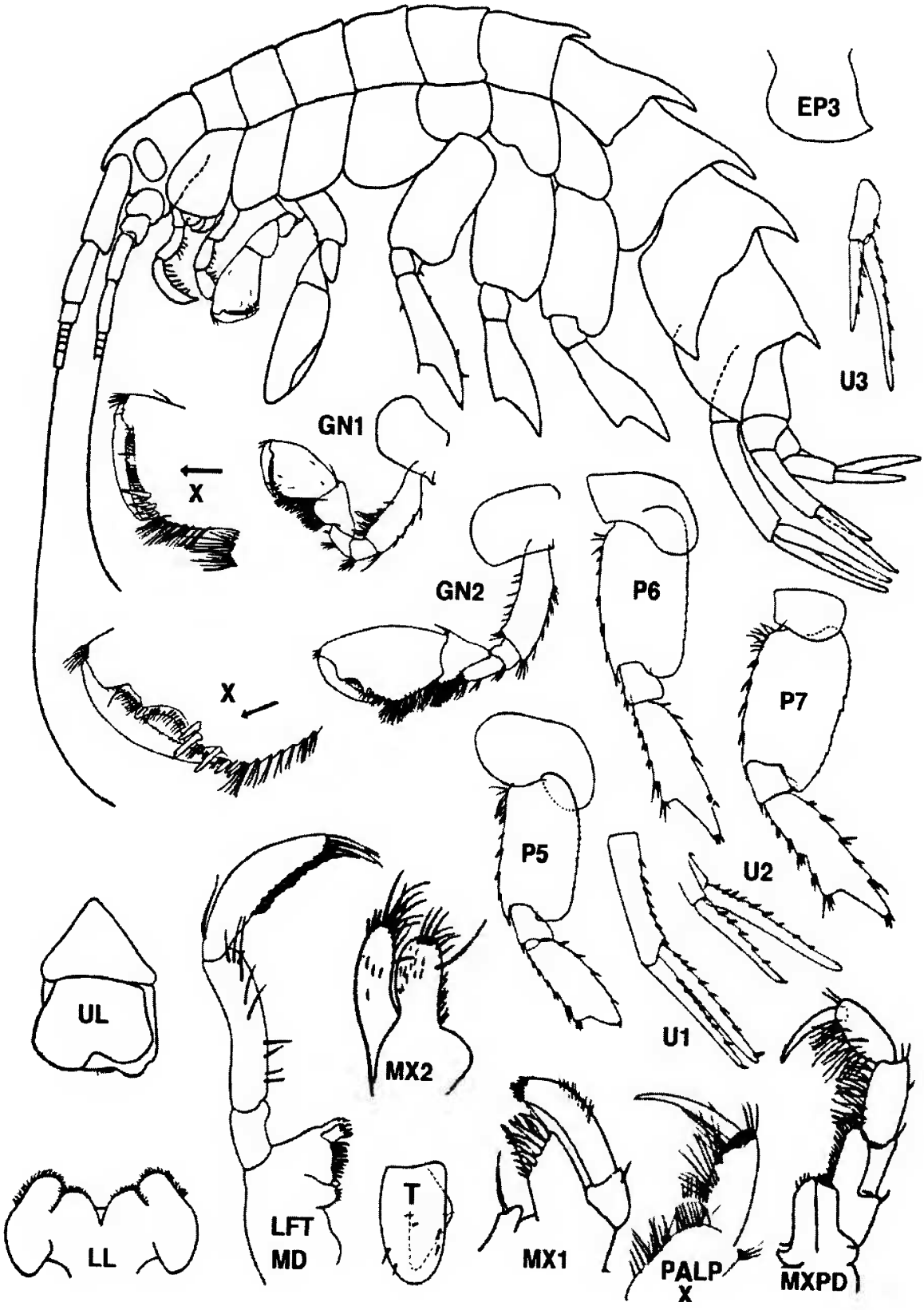


Fig. 31. ***Shoemakeroides gagarae*** (Gurjanova). Male (12 mm). Sea of Okhotsk. 515 m (modified from Gurjanova 1972).

PARAPLEUSTINAE Bousfield & Hendrycks

Parapleustinae emend Bousfield & Hendrycks 1995.

Genera: *Parapleuste* Buchholz, 1874; *Incisocalliope* Barnard, 1959; *Chromopleustes* Bousfield & Hendrycks, 1995; *Commensipleustes* B. & H., 1995; *Gnathopleustes* B. & H., 1995; *Micropleustes* B. & H., 1995; and *Trachypleustes* B. & H., 1995.

Emendation of diagnosis. The original subfamily diagnosis and key to subfamilies contained several character state restrictions that subsequent taxonomic additions and re-examination of material have necessitated broadening. Thus, with respect to Parapleustinae in key couplet 11, p. 34, of Bousfield and Hendrycks, 1994a, the text should read: "body dorsally smooth or occasionally with pleonal mucronations; urosome segment 2 ... dorsally occluded or nearly so" (as in the main text, p. 41). In key couplet 9 (leading to 10), the text should read: "mandibular palp segment 3, basal "A" seta small, weak, or lacking" (also as indicated on on p. 41).

Remarks: Three species allocated to genus *Neopleustes* and/or *Parapleustes* previously (e.g. Bousfield & Hendrycks 1995) are here transferred and/or returned to subfamily Parapleustinae. The first two were described from the western North Pacific region as *Neopleustes major* Bulycheva, 1952, and *N. triangoculata* Bulycheva, 1952. However, the descriptions and illustrations are now considered insufficiently diagnostic of either the genus *Neopleustes*, or even subfamily Neopleustinae. Numerical analysis of discernible character states indicates a best fit within subfamily Parapleustinae. The two species are tentatively assigned to genus *Gnathopleustes* Bousfield and Hendrycks 1995, pending full redescription of the type.

The third species, widely reported from the European, subarctic, and western North Atlantic (e.g. by Dunbar 1954, Brunel et al 1998, Bousfield 2001) is illustrated in Fig. 32. It has been treated as *Parapleustes bicuspis* (Kroyer, 1838) by Chevreux & Fage (1925) 186), Lincoln (1979), and Barnard & Karaman (1991). Lincoln also included *P. monocuspis* Sars, 1893, in the synonymy of *P. bicuspis*. From the western Pacific, *P. bicuspoides* Nagata, 1965, and *P. tricuspis* Ishimaru, 1984, are closely similar and may also belong here. *P. sinuipalmus* Dunbar, 1942, is currently treated as incerta sedis.

As a result of character state analysis (Fig. 35), we agree that the species meets essential character state requirements of subfamily Parapleustinae, as defined earlier (Bousfield & Hendrycks, 1994a), if they are broadened to include a dorsally mucronate condition, and dorsal non-occlusion of urosome segment 2. However, *bicuspis* does not conform well with genus *Parapleustes* sens. str. as more recently defined (Bousfield & Hendrycks, 1995). It differs mainly in its markedly unequal antennae, elongate spinose palmar margins of gnathopods 1 & 2, 2 plumose setae on the inner plate of maxilla 1, "hooked" hind corner of epimeral plate 3, as well as the dorsally mucronate pleon. On balance of character states the species is here tentatively assigned to genus *Incisocalliope* but confirmation of this decision awaits more complete descriptive treatment of all mouthparts, accessory flagellum, pleopods, coxal gills, and brood plates.

Subfamilies Neopleustinae and Pleustinae share the stub-like non triturating mandibular molar. However, most Neopleustinae are strongly carinated on pleon (often on posterior peraeon), the coxal plates tend to be modified with conspicuous cusps, maxilla 2 inner plate marginal seta is inserted remote from apical setae, and the maxilliped palp is slender and segment 3 is produced distallly beyond base of dactyl.

DISCUSSION

I. Taxonomic and Phyletic considerations.

The ancestral amphipod has been viewed as a natatory "perching" type crustacean (Steele 1988), of hydrodynamic body form to facilitate rapid forward swimming (Bousfield & Hendrycks 2002). On this premise, the external morphology of pleustid amphipods would appear relatively primitive and basic. Plesiomorphic features of external body form, and sensory and propulsive appendages (exemplified by *Parapleustes assimilis*) include smooth body outline, regularly deep coxal and epimeral plates, overlapping forwards and backwards from the "beam" segment (peraeon 5), closely subsimilar peraeopods with broad, smoothly rounded bases, powerful pleopods, and slender lancelote uropods. Less conspicuous is the "normal" complement of mouthparts, coxal gills, and setiferous brood lamellae of the female.

Apomorphic features include the very reduced antennal accessory flagellum, some mouthpart specializations (e.g., form of upper and lower lips, reduction of molar, loss or specialization of segments and setae of maxilla and maxillipeds), partial reduction of uropod 3, and fusion of telson lobes to form a simple plate.

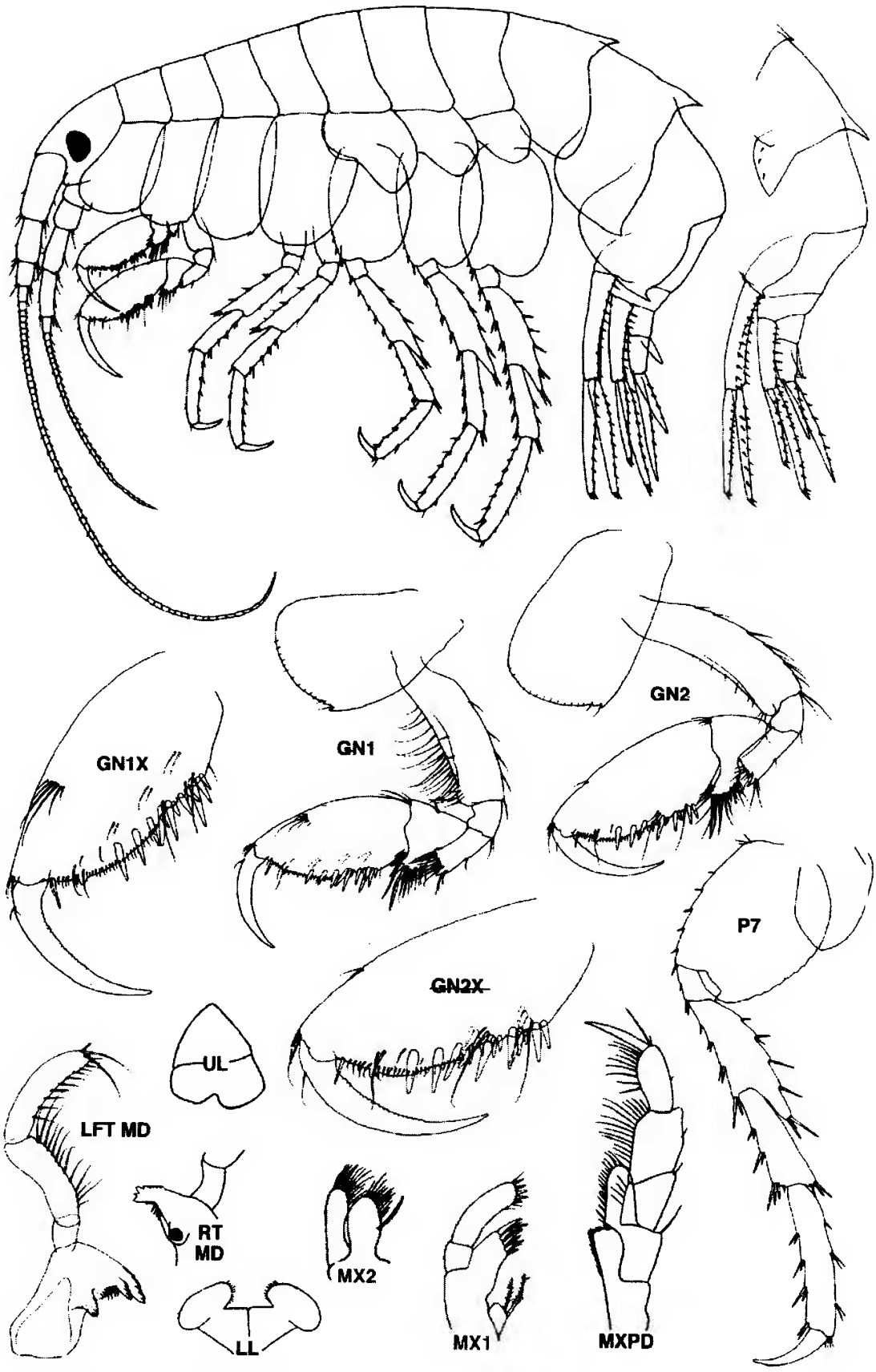


Fig. 32. ?*Incisocalliope bicuspis* (Kroyer). Female (to 12 mm). North Atlantic region. (after Lincoln, 1979)

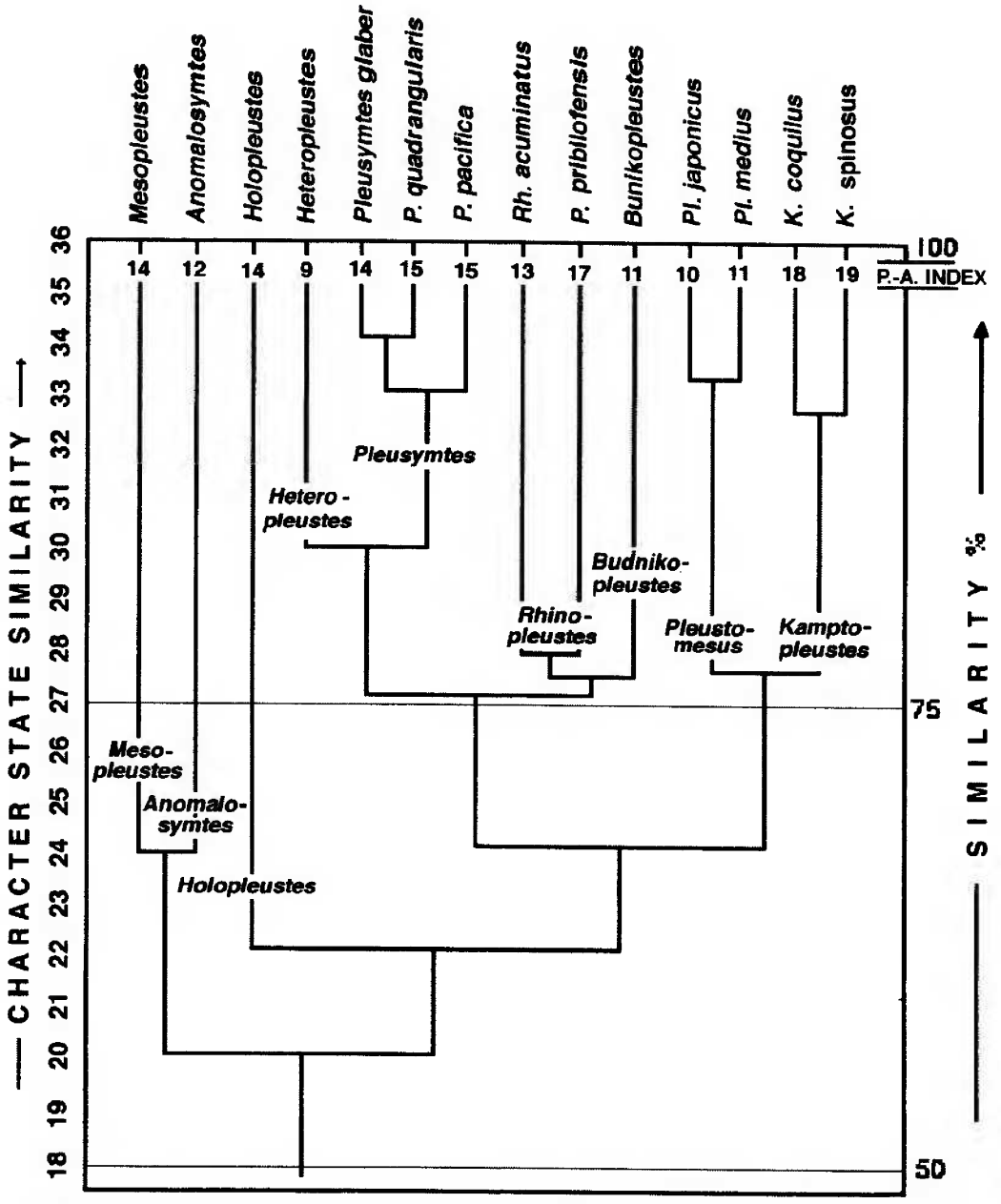


Fig. 33. Phenogram of similarities of genera within subfamilies Mesopleustinae and Pleusymtinae.

Analysis of variations in these external character states is here utilized in assessing possible phyletic relationships between the Pleusymtinae, Neopleustinae and most closely related subfamily groups, and within component genera and species (Figs. 33, 34, 35). Relationships within genera of the primitive families Pleusymtinae and Mesopleustinae are indicated in Fig. 33. To the left, grouped at about 70% level of similarity is the abyssal mesopleustinid genus *Mesopleustes*, and the primitive pleusymtinid genus *Anomalosymtes*. To the right are clustered the other seven genera of the Pleusymtinae mostly at the 70-75% level of similarity, except for the enigmatic and more distantly similar genus *Holopleustes*. Plesiomorphic character states of *Mesopleustes* include the form of the accessory flagellum, mouthparts, coxal plates, uropods and telson, but apomorphic states encompass body carination, rostrate head, anterodisally deflexed coxa 1, powerful dissimilar gnathopods, and narrowed peraeopod bases. *Anomalosymtes* demonstrates some of these (Fig. 20) but is linked pragmatically more closely to the Pleusymtinae by its smooth body form, plesiomorphic subsubimlar gnathopods, and more apomorphic mouthparts and uropods. The remaining five genera of Pleusymtinae cluster into three subgroups (Fig. 33): the closely similar smooth-bodied and primitive genera *Pleusymtes* and *Heteropleustes* on the left, and the more advanced, mainly carinate generic pairs of

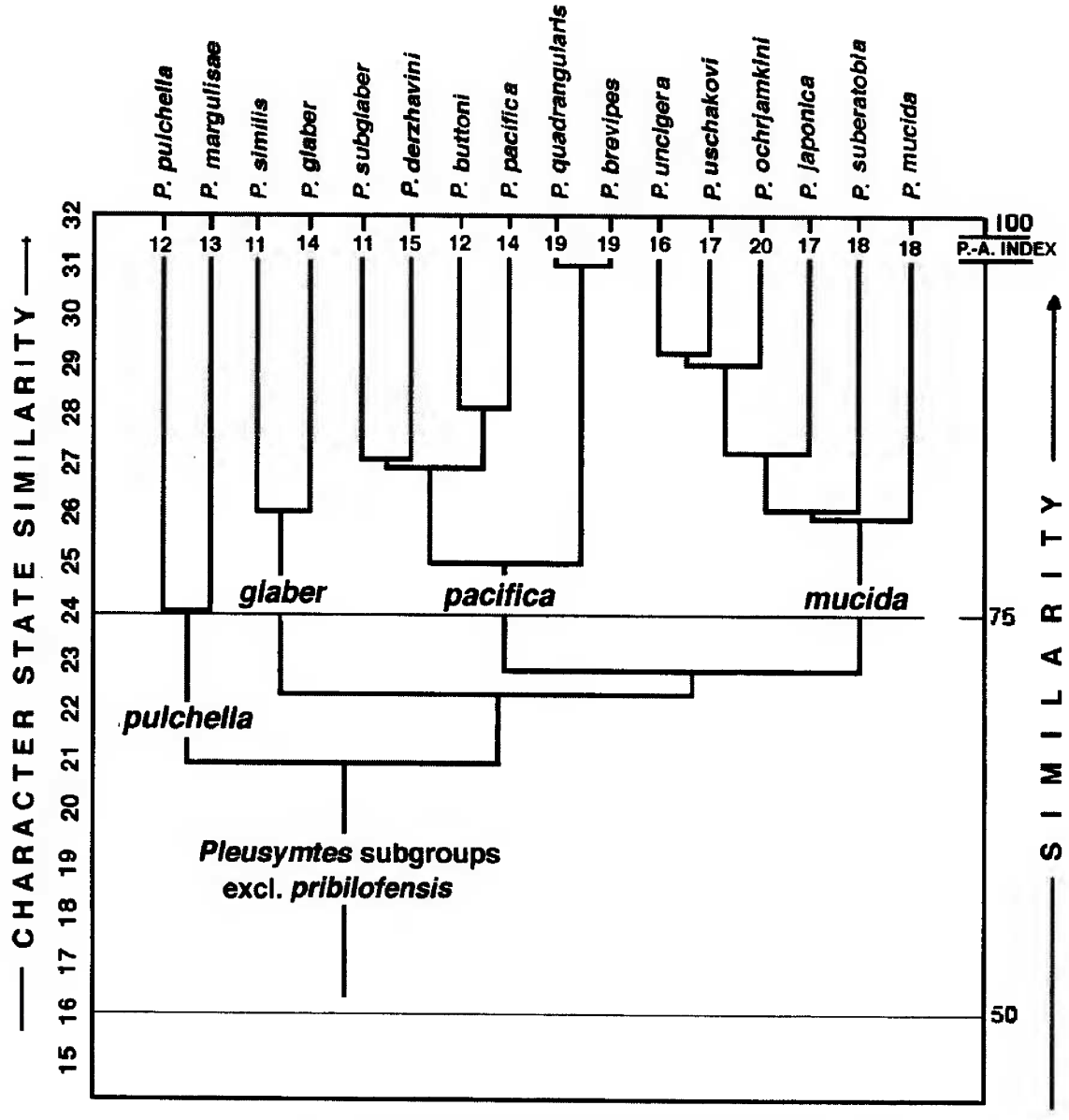


Fig. 34. Phenogram of similarities of species within *Pleusymtes* subgroups.

Rhinopleustes and its western Pacific counterpart *Budnikopleustes* in the centre, and the arctic and deeper water genera *Pleustomesus* and *Kamptopleustes* on the right.

Possible phyletic relationships within species of genus *Pleusymtes* are analyzed in fig. 34. The species cluster into four principal subgroups (excl. *pribilofensis* subgroup), at about the 75-80% level of similarity. To the extreme left are the relatively primitive North Atlantic and Arctic subgroup pairings of *pulchella-margulisae* and *glaber-similis.* These are united in similarities of mouthpart morphology, including 2 apical setae on the inner plate of maxilla 1, and other plesio-morphies. Species of the other two, more advanced subgroups are more closely similar, and occur entirely within the North Pacific basin. Species of the *pacifica* subgroup, in the centre left, are distinguished superficially by the well-developed posterodistal process on antennal peduncular segment 1, and the small cusp or "hook" on the posterodistal corner of epimeral plate 3. In species of the *mucida* subgroup, on the centre right, all confined to the Sea of Okhotsk and northern Sea of Japan, the antennal peduncular process is rudimentary or lacking and the hind corner of epimeral plate 3 is squared, or slightly produced.

Possible phyletic relationship of subfamily Neopleustinae and variously related subgroups are indicated by the morphological comparisons of Fig. 35. The Neopleustinae, on the centre left, here encom-

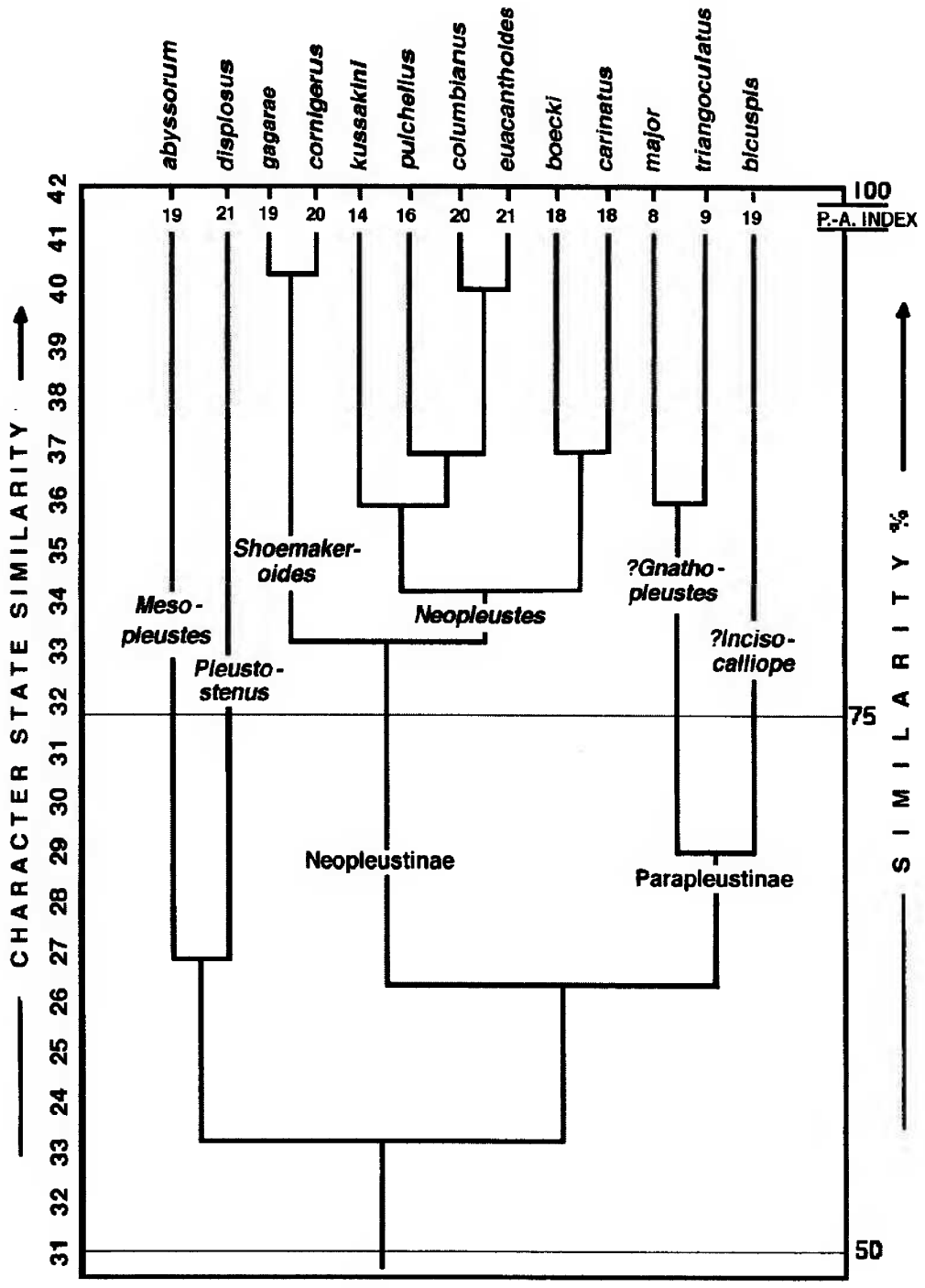


Fig. 35. Phenogram of similarities of genera within Neopleustinae, Parapleustinae and outgroups.

passes two genera, all showing various degrees of dorsal carination, and/or development of an antero-dorsal head ridge and/or rostrum, in addition to a non-triturative mandibular molar and other mouthpart specializations. Member species cling mainly to sessile benthic invertebrates (Tzvetkova and Kudrjashov 1975; Lincoln 1979) and are probably less natatory than the Pleusymtinae. Mouthpart morphology suggests that they are most closely related to the mainly smooth-bodied Parapleustinae (except for *I. bicuspis* and relatives), and more remote from *Pleustostenus* and *Mesopleustes*, on the far left. In form of gnathopods these deep water genera appear superficially similar to *Neopleustes* and *Shoemakeroides*, but their well developed triturating mandibular molars, possible presence of a right lacinia, deep coxal plates, and posterolobate bases of peraeopods 5-7 place them in more primitive subfamily groups.

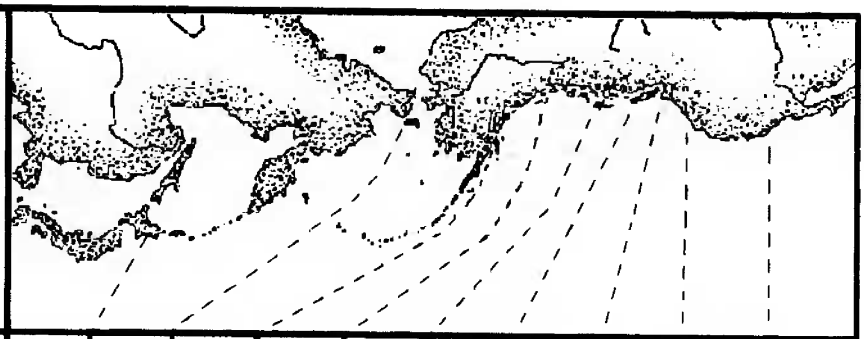
DISTRIBUTION ZONES: NORTH PACIFIC MARINE RIM REGION										
Genera and Species	**1** Northern Sea of Japan	**2** Okhotsk; West Bering Sea	**3** Bering Sea and Aleutians	**4** Prince William Sound	**5** Cross Sd to Dixon Entrance	**6** Nor. BC to North Vanc. Id.	**7** Central BC to S. Vanc. I.	**8** Wash'ton State	**9** Oregon Central Californ	**10** Southern & Baja Californ.
Ple. mucida	X									
Ple. japonica	X									
Het. brachypalmus	X									
Ple. brevipes	X	X								
Plm. japonicoides	X	X								
Kam. kamui	X	X								
Ple. similis		X								
Ple. derzhavini		X								
Ple. quadrangularis		X								
Ple. ochrjamkini		X								
Ple. suberatobia		X								
Ple. uschakovi		X								
Bud. vasinae		X								
Plu. displosus		X								
Ple. uncigera		X	X			X				
Ple. kariana			X							
Pleusymtes sp.			X							
Ple. pribiloffensis			X							
Pleusymtes sp. 2			X							
Rhi. acuminatus			X							
Ple. pacifica			X	X	X	X				
Kam. spinosus			X	X	X	X	X			
Ano. coxalis						X	X	X	X	
Het. setosus						X	X	X	X	
Hol. aequipes						X	X	X	X	
Pleusymtes sp. 1							X			
Kam. coquillus							X	X	X	
Ple. subglaber									X	X

Fig. 36. Geographical Distribution of North Pacific Genera and Species of Subfamily Pleusymtinae. (Generic Index: Ano - *Anomalosymtes*; Bud - *Budnikopleustes*; Het - *Heteropleustes*; Hol - *Holopleustes*; Kam - *Kamptopleustes*; Ple - *Pleusymtes*; Plm - *Pleustomesus*; Plu - *Pleustostenus;* Rhi - *Rhinopleustes.*

Within subfamily Stenopleustinae (not included in Fig. 35), *Arctopleustes* and *Stenopleustes* appear similar to *Neopleustes* in form of maxillipedal palp segment 3 (with distal process) and *Shoemakeroides* in form of gnathopods (dissimilar, powerful, carpus short). In view of basic plesiomorphies of the Stenopleustinae (e.g., eyes typically large and well-pigmented, urosome 2 not dorsally occluded,and uropod 1 lacking distolateral spines), the similarities are probably superfically convergent. Moreover, except for the warm-temperate *Gracilipleustes*, a mainly North Atlantic genus that penetrates into southern California (as *G. monocuspis*), subfamily Stenopleustinae is virtually unrepresented in the North Pacific region.

Except for the Neopleustinae, the subfamilies of family Pleustidae analyzed here are relatively primitive but the Pleustinae especially are highly diversified. They form a very much larger regional component than earlier noted, and reinforce recent studies on the primitive nature of the amphipod fauna of the North Pacific basin (Bousfield, 2001b).

Biogeographical considerations.

The relatively high regional endemicity of pleustid species in the North Pacific marine region is illustrated in Fig. 36. From west to east, coastal shelf regions may be subdivided into 10 biogeographical zones of which numbers 1 and 2 are Asiatic or western North Pacific, and zones 3-10 are North American or eastern North Pacific. Pleusymtinae is the taxonomically most diverse of regional subfamilies, presently with 27 of 33 known species, in 9 genera. Fifteen species in 3 genera occur along western Pacific shores. *Pleusymtes* is represented there by 10 species of which 8 species occur in the Sea of Okhotsk and western Bering Sea regions and 3 in the northern Sea of Japan. The monotypic genera *Budnikopleustes* and *Pleustostenus*, and one species each of *Pleustomesus* and *Heteropleustes* are also endemic to the western region. In minor contrast along the eastern Pacific shores, including the eastern Bering Sea and Aleutian Islands, only 14 species of subfamily Pleusymtinae and only 7 species of genus *Pleusymtes* were recorded. However, these are contained in six genera of which three are endemic.

With respect to their north-south (latitudinal) biogeographical significance, 8 of the 14 species were collected in Alaska and northern British Columbia whereas only 5 were recorded south of Washington state. Since pleustids are mainly cold water animals and occur mainly subtidally and at moderate depths, the animals tend to be relatively scarce, not only in present survey collections, but also in those of other N. American studies (e.g., Barnard 1962-1979). Perhaps pertinently, most pleusymtinid species were found sporadically and in low numbers in faunistic and ecological surveys in the western Pacific regions (e.g.,Tzvetkova and Kudrjaschov, 1985) and are seldom listed in fish stomach analyses.

Assuming comparable intensity of study, we may tentatively conclude that species diversity within subfamily Pleusymtinae appears greater in the western than in the eastern North Pacific. The reverse appears true of generic diversity, for reasons which presently remain speculative.

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